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TRAINING FOR MARINERS

Stability and Trim

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In illustration D001SA below, which item represents the righting arm?
GZ

Illustrations: D001SA_WM_110618

In illustration D001SA below, what represents the center of gravity?
G

Illustrations: D001SA_WM_110618

In illustration D001SA below, what represents the metacentric height?
GM

Illustrations: D001SA_WM_110618

The center of the underwater volume of a floating vessel is the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined principally by the location of the point of application of two forces: the upward-acting buoyant force and the _____.
downward-acting weight force

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stable equilibrium for a vessel means that the metacenter is _____.
higher than the center of gravity

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The geometric center of the underwater volume is known as the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

With no environmental forces, the center of gravity of an inclined vessel is vertically aligned with the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined by the relationship of the center of gravity and the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined principally by the location of the center of gravity and the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS

See REF133

The geometric center of the underwater volume of a floating vessel is the center of _____.
buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

With no environmental forces, the center of gravity of an inclined vessel is vertically aligned directly above the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined principally by the location of two points in a vessel: The center of buoyancy and the _____.
center of gravity

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The center of volume of the immersed portion of the hull is called the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The geometric center of the waterplane area is called the _____.
center of flotation

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined principally by the location of the point of application of two forces: the downward-acting gravity force and the _____.
upward-acting buoyant force

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined principally by the location of the point of application of two forces: the upward-acting buoyant force and the _____.
downward-acting weight force

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stable equilibrium for a vessel means that the metacenter is _____.
higher than the center of gravity

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The geometric center of the underwater volume is known as the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

With no environmental forces, the center of gravity of an inclined vessel is vertically aligned with the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined by the relationship of the center of gravity and the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

In small-angle stability, when external forces exist, the buoyant force is assumed to act vertically upwards through the center of buoyancy and through the _____.
metacenter

Illustrations: STABILITYDIAGRAM1
See REF133

In small angle stability, the metacentric height _____.
is calculated by subtracting KG from KM

Illustrations: STABILITYDIAGRAM1
See REF844

Stability is determined principally by the location of the center of gravity and the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The geometric center of the underwater volume of a floating vessel is the center of _____.
buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

With no environmental forces, the center of gravity of an inclined vessel is vertically aligned directly above the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined principally by the location of two points in a vessel: The center of buoyancy and the _____.
center of gravity

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The center of volume of the immersed portion of the hull is called the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The geometric center of the waterplane area is called the _____.
center of flotation

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stability is determined principally by the location of the point of application of two forces: the downward-acting gravity force and the _____.
upward-acting buoyant force

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The center of the underwater volume of a floating vessel is the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0039 below. What is the height above the main deck of the center of gravity of the cargo?
1.38 feet

Illustrations: ST0039WM
See REF833

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0036 below. What is the height above the main deck of the center of gravity of the cargo?
1.05 feet

Illustrations: ST0036WM
See REF832

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0030 below. What is the height above the main deck of the center of gravity of the cargo?
2.26 feet

Illustrations: ST0030WM
See REF831

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0027 below. What is the height above the main deck of the center of gravity of the cargo?
1.52 feet

Illustrations: ST0027WM
See REF830

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0020 below. What is the height above the main deck of the center of gravity of the cargo?
1.97 feet

Illustrations: ST0020WM
See REF829

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0019 below. What is the height above the main deck of the center of gravity of the cargo?
1.45 feet

Illustrations: ST0019WM
See REF828

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0018 below. What is the height above the main deck of the center of gravity of the cargo?
2.22 feet

Illustrations: ST0018WM
See REF827

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0015 below. What is the height above the main deck of the center of gravity of the cargo?
1.97 feet

Illustrations: ST0015WM
See REF826

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0004 below. What is the height above the main deck of the center of gravity of the cargo?
4.2 feet

Illustrations: ST0004WM
See REF825

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0003 below. What is the height above the main deck of the center of gravity of the cargo?
1.19 feet

Illustrations: ST0003WM
See REF824

You are on a supply run to an offshore drilling rig. You are carrying the load show in table ST-0002 below. What is the height above the main deck of the center of gravity of the cargo?
1.50 feet

Illustrations: ST0002WM
See REF823

The SS AMERICAN MARINER has the following drafts: FWD 08'-11.5", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0153 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
1.80 feet

Illustrations: ST0153WM
See REF822

The SS AMERICAN MARINER has the following drafts: FWD 08'-11.5", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0147 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.45 feet

Illustrations: ST0147WM
See REF821

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0146 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1545 tons

Illustrations: ST0146WM
See REF820

The SS AMERICAN MARINER has the following drafts: FWD 08'-11.5", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0144 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
3.00 feet

Illustrations: ST0144WM
See REF819

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0143 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1126 tons

Illustrations: ST0143WM
See REF818

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0141 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
344 tons

Illustrations: ST0141WM
See REF817

The SS AMERICAN MARINER has the following drafts: FWD 08'-11.5", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0138 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.05 feet

Illustrations: ST0138WM
See REF816

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0128 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
895 tons

Illustrations: ST0128WM
See REF815

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0126 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
595 tons

Illustrations: ST0126WM
See REF814

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0124 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1263 tons

Illustrations: ST0124WM
See REF813

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0076 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1912.5 tons

Illustrations: ST0076WM
See REF812

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0073 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1710.5 tons

Illustrations: ST0073WM
See REF811

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0070 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1503.0 tons

Illustrations: ST0070WM
See REF810

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0066 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1311.0 tons

Illustrations: ST0066WM
See REF809

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0062 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1171.5 tons

Illustrations: ST0062WM
See REF808

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0058 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
990 tons

Illustrations: ST0058WM
See REF807

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0053 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
750 tons

Illustrations: ST0053WM
See REF806

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0051 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
530 tons

Illustrations: ST0051WM
See REF805

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0049 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
395 tons

Illustrations: ST0049WM
See REF804

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0048 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
280 tons

Illustrations: ST0048WM
See REF803

The SS AMERICAN MARINER has the following drafts: FWD 8'-04", AFT 15'-08". Upon completion of loading and bunkering the items shown in table ST-0047 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
1.77 feet

Illustrations: ST0047WM
See REF802

The SS AMERICAN MARINER has the following drafts: FWD 10'-04", AFT 14'-08". Upon completion of loading and bunkering the items shown in table ST-0045 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
1.91 feet

Illustrations: ST0045WM
See REF801

The SS AMERICAN MARINER has the following drafts: FWD 09'-10", AFT 15'-08". Upon completion of loading and bunkering the items shown in table ST-0041 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.21 feet

Illustrations: ST0041WM
See REF800

The SS AMERICAN MARINER has the following drafts: FWD 08'-04", AFT 16'-08". Upon completion of loading and bunkering the items shown in table ST-0037 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.48 feet

Illustrations: ST0037WM
See REF799

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11". Upon completion of loading and bunkering the items shown in table ST-0034 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.62 feet

Illustrations: ST0034WM
See REF798

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0033 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
1.82 feet

Illustrations: ST0033WM
See REF797

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11". Upon completion of loading and bunkering the items shown in table ST-0032 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.82 feet

Illustrations: ST0032WM
See REF796

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11". Upon completion of loading and bunkering the items shown in table ST-0029 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.97 feet

Illustrations: ST0029WM
See REF795

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0026 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.38 feet

Illustrations: ST0026WM
See REF794

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0025 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
2.05 feet

Illustrations: ST0025WM
See REF793

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11". Upon completion of loading and bunkering the items shown in table ST-0023 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
3.15 feet

Illustrations: ST0023WM
See REF792

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11.5". Upon completion of loading and bunkering the items shown in table ST-0021 below will be on board. Use the white pages of The Stability Data Reference Book to determine the minimum GM required to meet a one compartment standard.
1.98 feet

Illustrations: ST0021WM
See REF791

The SS AMERICAN MARINER has the following drafts: FWD 09'-00", AFT 15'-11". Upon completion of loading and bunkering the items shown in table ST-0014 below will be on board. Use the white pages of The Stability data Reference Book to determine the minimum GM required to meet a one compartment standard.
3.24 feet

Illustrations: ST0014WM
See REF790

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0011 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
696 tons

Illustrations: ST0011WM
See REF789

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0010 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
1248 tons

Illustrations: ST0010WM
See REF788

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0005 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
158 tons

Illustrations: ST0005WM
See REF787

The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0001 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.
263 tons

Illustrations: ST0001WM
See REF786

The SS AMERICAN MARINER has on board 4850 tons of cargo with an LCG-FP of 274.46 feet. See table ST-0195 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 271.23 feet

Illustrations: ST0195WM
See REF785

The SS AMERICAN MARINER has on board 6450 tons of cargo with an LCG-FP of 270.89 feet. See table ST-0194 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 270.97 feet

Illustrations: ST0194WM
See REF784

The SS AMERICAN MARINER has on board 6048 tons of cargo with an LCG-FP of 270.71 feet. See table ST-0193 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 267.03 feet

Illustrations: ST0193WM
See REF783

The SS AMERICAN MARINER has on board 5480 tons of cargo with an LCG-FP of 274.46 feet. See table ST-0191 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 272.87 feet

Illustrations: ST0191WM
See REF782

The SS AMERICAN MARINER has on board 5540 tons of cargo with an LCG-FP of 272.20 feet. See table ST-0169 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 267.8 feet

Illustrations: ST0169WM
See REF781

The SS AMERICAN MARINER has on board 3885 tons of cargo with an LCG-FP of 278.45 feet. See table ST-0168 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 268.4 feet

Illustrations: ST0168WM
See REF780

The SS AMERICAN MARINER has on board 3245 tons of cargo with an LCG-FP of 272.20 feet. See table ST-0166 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 267.7 feet

Illustrations: ST0166WM
See REF779

The SS AMERICAN MARINER has on board 7240 tons of cargo with an LCG-FP of 273.20 feet. See table ST-0165 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 275.3 feet

Illustrations: ST0165WM
See REF778

The SS AMERICAN MARINER has on board 4824 tons of cargo with an LCG-FP of 277.45 feet. See table ST-0164 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 269.2 feet

Illustrations: ST0164WM
See REF777

The SS AMERICAN MARINER has on board 5577 tons of cargo with an LCG-FP of 275.55 feet. See table ST-0163 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 271.2 feet

Illustrations: ST0163WM
See REF776

The SS AMERICAN MARINER has on board 6285 tons of cargo with an LCG-FP of 272.45 feet. See table ST-0162 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 272.1 feet

Illustrations: ST0162WM
See REF775

The SS AMERICAN MARINER has on board 6584 tons of cargo with an LCG-FP of 277.84 feet. See table ST-0161 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 274.6 feet

Illustrations: ST0161WM
See REF774

The SS AMERICAN MARINER has on board 5486 tons of cargo with an LCG-FP of 277.84 feet. See table ST-0160 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 273.6 feet

Illustrations: ST0160WM
See REF773

The SS AMERICAN MARINER has on board 4850 tons of cargo with an LCG-FP of 279.84 feet. See table ST-0159 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 270.6 feet

Illustrations: ST0159WM
See REF772

The SS AMERICAN MARINER has the liquid load shown in table ST-0157 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
273.5 ft

Illustrations: ST0157WM
See REF771

The SS AMERICAN MARINER has the liquid load shown in table ST-0156 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
253.5 ft

Illustrations: ST0156WM
See REF770

The SS AMERICAN MARINER has the liquid load shown in table ST-0155 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
236.7 ft

Illustrations: ST0155WM
See REF769

The SS AMERICAN MARINER has the liquid load shown in table ST-0150 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
228.8 ft

Illustrations: ST0150WM
See REF768

The SS AMERICAN MARINER has the liquid load shown in table ST-0148 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
246.8 ft

Illustrations: ST0148WM
See REF767

The SS AMERICAN MARINER has the liquid load shown in table ST-0145 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
268.8 ft

Illustrations: ST0145WM
See REF766

The SS AMERICAN MARINER has the liquid load shown in table ST-0137 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
294.4 ft

Illustrations: ST0137WM

See REF765

The SS AMERICAN MARINER has the liquid load shown in table ST-0122 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
291.0 ft

Illustrations: ST0122WM
See REF764

The SS AMERICAN MARINER has the liquid load shown in table ST-0119 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
250.5 ft

Illustrations: ST0119WM
See REF763

The SS AMERICAN MARINER has the liquid load shown in table ST-0118 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
307.2 ft

Illustrations: ST0118WM
See REF762

The SS AMERICAN MARINER has the liquid load shown in table ST-0116 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
231.0 ft

Illustrations: ST0116WM
See REF761

The SS AMERICAN MARINER has on board 6080 tons of cargo with an LCG-FP of 270.71 feet. See table ST-0111 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 266.7 feet

Illustrations: ST0111WM
See REF760

The SS AMERICAN MARINER has on board 6048 tons of cargo with an LCG-FP of 270.89 feet. See table ST-0109 below for the distribution of the cargo to be loaded. Use the white pages of the Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 266.6 feet

Illustrations: ST0109WM
See REF759

The SS AMERICAN MARINER has on board 4850 tons of cargo with an LCG-FP of 275.72 feet. See table ST-0107 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 266.7 feet

Illustrations: ST0107WM
See REF758

The SS AMERICAN MARINER has on board 5480 tons of cargo with an LCG-FP of 272.20 feet. See table ST-0105 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 265.1 feet

Illustrations: ST0105WM
See REF757

The SS AMERICAN MARINER has on board 6450 tons of cargo with an LCG-FP of 274.46 feet. See table ST-0101 below for the distribution of the cargo to be loaded. Use the white pages of The Stability Data Reference Book to determine the final LCG-FP of the cargo.
LCG-FP 269.8 feet

Illustrations: ST0101WM
See REF756

The SS AMERICAN MARINER has the liquid load shown in table ST-0100 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
251.9 ft

Illustrations: ST0100WM
See REF755

The SS AMERICAN MARINER has the liquid load shown in table ST-0098 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
268.1 ft

Illustrations: ST0098WM
See REF754

The SS AMERICAN MARINER has the liquid load shown in table ST-0095 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
286.2 ft

Illustrations: ST0095WM
See REF753

The SS AMERICAN MARINER has the liquid load shown in table ST-0093 below. Use the white pages of The Stability Data Reference Book to determine the LCG-FP of the liquid load.
282.7 ft

Illustrations: ST0093WM
See REF752

The SS AMERICAN MARINER has the liquid load shown in table ST-0142 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
4.3 feet

Illustrations: ST0142WM
See REF751

The SS AMERICAN MARINER has the liquid load shown in table ST-0136 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
7.1 feet

Illustrations: ST0136WM

See REF750

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0135 below. There is already 6280 tons of cargo on board with a KG of 25.5 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 26.0 feet

Illustrations: ST0135WM
See REF749

The SS AMERICAN MARINER has the liquid load shown in table ST-0133 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
4.9 feet

Illustrations: ST0133WM
See REF748

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0132 below. There is already 3175 tons of cargo on board with a KG of 25.8 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 26.8 feet

Illustrations: ST0132WM
See REF747

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0131 below. There is already 3485 tons of cargo on board with a KG of 24.4 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 25.6 feet

Illustrations: ST0131WM
See REF746

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0130 below. There is already 4260 tons of cargo on board with a KG of 25.8 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 25.9 feet

Illustrations: ST0130WM
See REF745

The SS AMERICAN MARINER has the liquid load shown in table ST-0129 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
5.8 feet

Illustrations: ST0129WM
See REF744

The SS AMERICAN MARINER has the liquid load shown in table ST-0127 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
7.9 feet

Illustrations: ST0127WM
See REF743

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0125 below. There is already 4236 tons of cargo on board with a KG of 27.2 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 26.9 feet

Illustrations: ST0125WM
See REF742

The SS AMERICAN MARINER has the liquid load shown in table ST-0106 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
3.9 feet

Illustrations: ST0106WM
See REF741

The SS AMERICAN MARINER has the liquid load shown in table ST-0104 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
10.7 feet

Illustrations: ST0104WM
See REF740

The SS AMERICAN MARINER has the liquid load shown in table ST-0097 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
10.6 feet

Illustrations: ST0097WM
See REF739

The SS AMERICAN MARINER has the liquid load shown in table ST-0083 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
9.1 feet

Illustrations: ST0083WM
See REF738

The SS AMERICAN MARINER has the liquid load shown in table ST-0077 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
4.0 feet

Illustrations: ST0077WM
See REF737

The SS AMERICAN MARINER has the liquid load shown in table ST-0075 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
5.6 feet

Illustrations: ST0075WM
See REF736

The SS AMERICAN MARINER has the liquid load shown in table ST-0067 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
6.0 feet

Illustrations: ST0067WM
See REF735

The SS AMERICAN MARINER has the liquid load shown in table ST-0064 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
4.3 feet

Illustrations: ST0064WM
See REF734

The SS AMERICAN MARINER has the liquid load shown in table ST-0063 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
6.8 feet

Illustrations: ST0063WM
See REF733

The SS AMERICAN MARINER has the liquid load shown in table ST-0057 below. Use the white pages of The Stability Data Reference Book to determine the KG of the liquid load.
7.7 feet

Illustrations: ST0057WM
See REF732

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0055 below. There is already 3684 tons of cargo on board with a KG of 28.4 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 27.6 feet

Illustrations: ST0055WM
See REF731

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0050 below. There is already 2865 tons of cargo on board with a KG of 27.8 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 28.5 feet

Illustrations: ST0050WM
See REF730

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0043 below. There is already 3284 tons of cargo on board with a KG of 26.4 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 25.5 feet

Illustrations: ST0043WM
See REF729

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0042 below. There is already 2464 tons of cargo on board with a KG of 27.3 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 28.6 feet

Illustrations: ST0042WM
See REF728

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0038 below. There is already 6422 tons of cargo on board with a KG of 26.6 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 24.9 feet

Illustrations: ST0038WM
See REF727

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0035 below. There is already 3224 tons of cargo on board with a KG of 29.8 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 29.0 feet

Illustrations: ST0035WM
See REF726

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0031 below. There is already 4145 tons of cargo on board with a KG of 25.5 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 25.0 feet

Illustrations: ST0031WM
See REF725

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0028 below. There is already 3315 tons of cargo on board with a KG of 27.0 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 28.6 feet

Illustrations: ST0028WM
See REF724

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0022 below. There is already 2685 tons of cargo on board with a KG of 27.4 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 26.0 feet

Illustrations: ST0022WM
See REF723

The SS AMERICAN MARINER is ready to load the cargo listed in table ST-0008 below. There is already 4184 tons of cargo on board with a KG of 27.8 feet. Use the white pages of the Stability Data Reference Book to determine the final KG of all the cargo after loading is completed.
KG 25.8 feet

Illustrations: ST0008WM
See REF722

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 13'-10", AFT 16'-04". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0187. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.73 foot

Illustrations: ST0187WM
See REF721

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 14'-04", AFT 17'-06". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0180. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.48 feet

Illustrations: ST0180WM
See REF720

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 13'-10", AFT 16'-04". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0179. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.01 foot

Illustrations: ST0179WM
See REF719

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 17'-06", AFT 20'-04". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0178. Use the white pages of The Stability Data Reference Book to determine the free surface correction
1.31 feet

Illustrations: ST0178WM
See REF718

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 21'-04", AFT 26'-04". After all bunkers are on board, soundings indicate the tonnages shown Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.62 foot

Illustrations: ST0177WM
See REF717

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 14'-04", AFT 18'-08". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0176. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.25 feet

Illustrations: ST0176WM
See REF716

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 17'-05", AFT 19'-07". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0175. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.99 foot

Illustrations: ST0175WM
See REF715

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 15'-05", AFT 21'-03". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0174. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.15 feet

Illustrations: ST0174_WM_090622, HYDROPROPTABLE5234, FSCORRECTION5234
See REF714

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 15'-05", AFT 21'-03". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0174. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.15 feet

Illustrations: ST0174_WM_090622, HYDROPROPTABLE5234, FSCORRECTION5234
See REF714

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 15'-05", AFT 21'-03". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0174. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.15 feet

Illustrations: ST0174_WM_090622, HYDROPROPTABLE5234, FSCORRECTION5234
See REF714

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 14'-04", AFT 18'-08". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0173. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.05 feet

Illustrations: ST0173WM
See REF713

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 20'-04", AFT 23'-06". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0172 below. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.80 foot

Illustrations: ST0172WM
See REF712

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 19'-00", AFT 24'-00". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0171 Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.85 foot

Illustrations: ST0171WM
See REF711

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 21'-04", AFT 26'-04". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0170 below Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.54 ft

Illustrations: ST0170WM
See REF710

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 12'-07", AFT 16'-01". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0167 below. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.07 foot

Illustrations: ST0167WM
See REF709

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 11'-01", AFT 14'-07". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0158 below. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.30 feet

Illustrations: ST0158WM
See REF708

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 11'-01", AFT 15'-01". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0103. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
1.14 feet

Illustrations: ST0103WM
See REF707

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 18'-06", AFT 20'-06". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0099. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.91 foot

Illustrations: ST0099WM
See REF706

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 11'-01", AFT 15'-01". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0091. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.73 foot

Illustrations: ST0091WM
See REF705

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 11'-01", AFT 15'-01". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0086. Use the white pages of The Stability Data Reference Book to determine the free surface correction. ST-0086

DB 1	CL	48.2	DB 6	CL	242.3
DB 1A	CL	81.9	DB 7	P	94.6
DB 2	P	71.2	DB 7	S	94.6
DB 2	S	71.2	DT 1	CL	125.3
DB 3	CL	227.6	DT 1A	CL	257.6
DB 3	P	55.6	DT 2	P	80.0
DB 3	S	55.6	DT 2	S	80.0
DB 4	CL	224.1	DT 6	P	201.2
DB 4	P	128.1	DT 6	S	201.2
DB 4	S	128.1	DT 7	P	128.8
DT 7	S	128.8			

0.68 foot

Illustrations: ST0086WM
See REF704

The SS AMERICAN MARINER is ready to bunker with drafts of FWD 14'-06", AFT 17'-00". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0085. Use the white pages of The Stability Data Reference Book to determine the free surface correction.
0.84 foot

Illustrations: ST0085WM
See REF703

The SS AMERICAN MARINER arrived in port with drafts of: FWD 19'-10.5", AFT 22'-11.6". Cargo was loaded and discharged as indicated in table ST-0154 below. Use sheet 2 in the white pages of The Stability Data Reference Book to determine the final drafts.
FWD 19'-07.6", AFT 22'-10.4"

Illustrations: ST0154WM
See REF702

The SS AMERICAN MARINER arrived in port with drafts of: FWD 18'-06", AFT 20'-10". Cargo was loaded and discharged as indicated in table ST-0152 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 19'-05", AFT 19'- 08"

Illustrations: ST0152WM
See REF701

The SS AMERICAN MARINER arrived in port with drafts of: FWD 18'-10", AFT 18'-06". Cargo was loaded and discharged as indicated in table ST-0140 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 18'-04", AFT 19'- 02"

Illustrations: ST0140WM
See REF700

The SS AMERICAN MARINER arrived in port with drafts of: FWD 17'-10", AFT 19'-06". Cargo was loaded and discharged as indicated in table ST-0134 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 17'-04", AFT 20'- 08"

Illustrations: ST0134WM
See REF699

The SS AMERICAN MARINER arrived in port with drafts of: FWD 18'-06", AFT 21'-10". Cargo was loaded and discharged as indicated in table ST-0123 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 18'-08", AFT 21'- 04"

Illustrations: ST0123WM
See REF698

The SS AMERICAN MARINER will sail with the load shown in table ST-0120 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 26'-05", AFT 28'- 07"

Illustrations: ST0120WM
See REF697

The SS AMERICAN MARINER will sail with the load shown in table ST-0117 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 17'-11", AFT 22'- 07"

Illustrations: ST0117WM
See REF696

The SS AMERICAN MARINER will sail with the load shown in table ST-0115 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 25'-02", AFT 29'- 10"

Illustrations: ST0115WM
See REF695

The SS AMERICAN MARINER arrived in port with drafts of: FWD 18'-05", AFT 20'-11". Cargo was loaded and discharged as indicated in table ST-0114 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 18'-07", AFT 20'- 11"

Illustrations: ST0114WM
See REF694

The SS AMERICAN MARINER will sail with the load shown in table ST-0113 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 17'-10", AFT 22'- 00"

Illustrations: ST0113WM
See REF693

The SS AMERICAN MARINER will sail with the load shown in table ST-0112 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 24'-10", AFT 27'- 10"

Illustrations: ST0112WM
See REF692

The SS AMERICAN MARINER arrived in port with drafts of: FWD 29'-06", AFT 29'-02". Cargo was loaded and discharged as indicated in table ST-0110 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 29'-03", AFT 30'- 00"

Illustrations: ST0110WM
See REF691

The SS AMERICAN MARINER arrived in port with drafts of: FWD 28'-04", AFT 29'-10". Cargo was loaded and discharged as indicated in table ST-0102 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 27'-03", AFT 29'- 09"

Illustrations: ST0102WM
See REF690

The SS AMERICAN MARINER will sail with the load shown in table ST-0094 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 25'-06", AFT 26'- 11"

Illustrations: ST0094WM
See REF689

The SS AMERICAN MARINER arrived in port with drafts of: FWD 28'-04", AFT 30'-08". Cargo was loaded and discharged as indicated in table ST-0092 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 29'-05", AFT 29'- 09"

Illustrations: ST0092WM
See REF688

The SS AMERICAN MARINER will sail with the load shown in table ST-0090 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 17'-06", AFT 24'- 03"

Illustrations: ST0090WM
See REF687

The SS AMERICAN MARINER arrived in port with drafts of: FWD 21'-10.6", AFT 22'-11.6". Cargo was loaded and discharged as indicated in table ST-0089 below. Use sheet 2 in the white pages of The Stability Data Reference Book to determine the final drafts.
FWD 21'-10.0", AFT 22'-10.0"

Illustrations: ST0089WM
See REF686

The SS AMERICAN MARINER arrived in port with drafts of: FWD 21'-09.5", AFT 22'-09.5". Cargo was loaded and discharged as indicated in table ST-0087 below. Use sheet 2 in the white pages of The Stability Data Reference Book to determine the final drafts.
FWD 21'-11.3", AFT 23'-01.8"

Illustrations: ST0087WM
See REF685

The SS AMERICAN MARINER will sail with the load shown in table ST-0084 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 25'-06", AFT 30'- 00"

Illustrations: ST0084WM
See REF684

The SS AMERICAN MARINER will sail with the load shown in table ST-0082 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 25'-09", AFT 27'- 02"

Illustrations: ST0082WM
See REF683

The SS AMERICAN MARINER arrived in port with drafts of: FWD 28'-08", AFT 29'-05'. Cargo was loaded and discharged as indicated in table ST-0081 below.. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 29'-05", AFT 28'- 05"

Illustrations: ST0081WM
See REF682

The SS AMERICAN MARINER arrived in port with drafts of: FWD 19'-06.6", AFT 20'-05.6". Cargo was loaded and discharged as indicated in table ST-0079 below. Use sheet 2 in the white pages of The Stability Data Reference book to determine the final drafts.
FWD 20'-06", AFT 21'- 02"

Illustrations: ST0079WM
See REF681

The SS AMERICAN MARINER arrived in port with drafts of: FWD 21'-06.5", AFT 23'-05.4". Cargo was loaded and discharged as indicated in table ST-0072 below. Use sheet 2 in the white pages of The Stability Data Reference Book to determine the final drafts.
FWD 21'-10.0", AFT 23'-06.0"

Illustrations: ST0072WM
See REF680

The SS AMERICAN MARINER will sail with the load shown in table ST-0061 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 20'-11", AFT 26'- 09"

Illustrations: ST0061WM
See REF679

The SS AMERICAN MARINER will sail with the load shown in table ST-0024 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 27'-00", AFT 28'- 03"

Illustrations: ST0024WM
See REF678

The SS AMERICAN MARINER will sail with the load shown in table ST-0017 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 26'-09", AFT 28'- 00"

Illustrations: ST0017WM
See REF677

The SS AMERICAN MARINER will sail with the load shown in table ST-0016 below. Use the white pages of The Stability Data Reference Book to determine the drafts
FWD 23'-07", AFT 26'- 07"

Illustrations: ST0016WM
See REF676

The SS AMERICAN MARINER arrived in port with drafts of: FWD28'-08", AFT 29'-05". Cargo was loaded and discharged as indicated in table ST-0013 below. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts. ST-0013

```
Discharge 120 tons    145 feet fwd of amidships
Load 160 tons          87 feet fwd of amidships
Discharge 85 tons      50 feet fwd of amidships
Discharge 100 tons     30 feet aft of amidships
```

FWD 28'-04", AFT 29'- 05"

Illustrations: ST0013WM
See REF675

The SS AMERICAN MARINER arrived in port with drafts of: FWD 28'-08", AFT 29'-05". Cargo was loaded and discharged as indicated in table ST-0012 below. Use sheet 2 in the white pages of The Stability Data Reference Book to determine the final drafts. ST-0012

```
Load 225 tons       110 ft fwd of amidships
Discharge 120 tons   37 ft fwd of amidships
Load 125 tons        30 ft aft of amidships
Load 75 tons        200 ft aft of amidships
```

FWD 29'-02", AFT 29'- 07"

Illustrations: ST0012WM
See REF674

The SS AMERICAN MARINER arrived in port with drafts of: FWD28'-04", AFT 30'-11". Cargo was loaded and discharged as indicated in table ST-0009 below. Use sheet 2 in the white pages of the Stability Data Reference Book to determine the final drafts.
FWD 29'-01", AFT 30'- 10"

Illustrations: ST0009WM
See REF673

The SS AMERICAN MARINER arrived in port with drafts of: FWD 28'-04", AFT 31'-10". Cargo was loaded and discharged as indicated in table ST-0007 below. Use sheet 2 in the white pages of The Stability Data Reference Book to determine the final drafts.
FWD 29'-08", AFT 30'- 09"

Illustrations: ST0007WM
See REF672

The SS AMERICAN MARINER will sail with the load shown in table ST-0006 below. Use the white pages of The Stability Data Reference Book to determine the drafts.
FWD 23'-03", AFT 27'- 00"

Illustrations: ST0006WM
See REF671

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0192 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 5.5 ft

Illustrations: ST0192WM
See REF670

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0190 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 5.1 ft

Illustrations: ST0190WM
See REF669

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0189 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.7 ft

Illustrations: ST0189WM
See REF668

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0188 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.3 ft

Illustrations: ST0188WM
See REF667

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0186 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.1 ft

Illustrations: ST0186WM
See REF666

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0185 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.8 ft

Illustrations: ST0185WM
See REF665

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0184 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.5 ft

Illustrations: ST0184WM
See REF664

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0183 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.2 ft

Illustrations: ST0183WM
See REF663

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0182 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 2.4 ft

Illustrations: ST0182WM
See REF662

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0181 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 2.8 ft

Illustrations: ST0181WM
See REF661

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0149 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.0 ft

Illustrations: ST0149WM
See REF660

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0139 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.5 ft

Illustrations: ST0139WM
See REF659

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0121 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.98 ft

Illustrations: ST0121WM
See REF658

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0108 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.28 ft

Illustrations: ST0108WM
See REF657

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0096 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.07 ft

Illustrations: ST0096WM
See REF656

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0088 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.16 ft

Illustrations: ST0088WM
See REF655

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0080 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.2 ft

Illustrations: ST0080WM
See REF654

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0078 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.1 ft

Illustrations: ST0078WM
See REF653

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0074 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.3 ft

Illustrations: ST0074WM
See REF652

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0071 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.8 ft

Illustrations: ST0071WM
See REF651

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0069 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.9 ft

Illustrations: ST0069WM
See REF650

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0068 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.11 ft

Illustrations: ST0068WM
See REF649

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0065 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 5.0 ft

Illustrations: ST0065WM
See REF648

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0060 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.24 ft

Illustrations: ST0060WM
See REF647

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0059 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM
Available GM 3.9 ft

Illustrations: ST0059WM
See REF646

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0056 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 4.1 ft

Illustrations: ST0056WM
See REF645

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0054 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.6 ft

Illustrations: ST0054WM
See REF644

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0052 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 3.8 ft

Illustrations: ST0052WM
See REF643

The SS AMERICAN MARINER is ready to sail with the load shown in table ST-0046 below. Use Use the white pages of The Stability Data Reference Book to determine the available GM.
Available GM 5.4 ft

Illustrations: ST0046WM
See REF642

The SS AMERICAN MARINER is ready to sail with the load shown Use the white pages of The Stability Data Reference Book to determine the available GM. ST-0040
Available GM 4.1 ft

Illustrations: ST0040WM
See REF641

You are loading in a port subject to the summer load line mark and bound for a port subject to the tropical load line mark. You will enter the tropical zone after steaming four days. You will consume 33 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.006, and the average TPI is 66. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0022 below.
78 inches

Illustrations: BL0022WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the summer load line mark. You will enter the summer zone after steaming two days. You will consume 28 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.020, and the average TPI is 55. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0021 below.
74 inches

Illustrations: BL0021WM

You are loading in a port subject to the winter load line mark and bound for a port subject to the summer load line mark. You will enter the summer zone after steaming six days. You will consume 32 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.005, and the average TPI is 65. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0020 below.
81 inches

Illustrations: BL0020WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the summer load line mark. You will enter the summer zone after steaming four days. You will consume 41 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.000 and the average TPI is 55. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0019 below.
41 inches

Illustrations: BL0019WM

You are loading in a port subject to the summer load line mark and bound for a port subject to the winter load line mark. You will enter the winter zone after steaming four days. You will consume 35 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.0083, and the average TPI is 65. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0018 below.
74 inches

Illustrations: BL0018WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the summer load line mark. You will enter the summer zone after steaming ten days. You will consume 33 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.021, and the average TPI is 51. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0017 below.
72 inches

Illustrations: BL0017WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the winter load line mark. You will enter the summer zone after steaming four days, and you will enter the winter zone after a total of nine days. You will consume 29 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.008, and the average TPI is 53. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0016 below.
80.0 inches

Illustrations: BL0016WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the winter load line mark. You will enter the summer zone after steaming eight days, and you will enter the winter zone after a total of ten days. You will consume 31 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.016, and the average TPI is 41. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0015 below.
68 inches

Illustrations: BL0015WM

You are loading in a port subject to the winter load line mark and bound for a port subject to the tropical load line mark. You will enter the summer zone after steaming four days, and you will enter the tropical zone after a total of twelve days. You will consume 31 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.000, and the average TPI is 46. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0013 below.
78 inches

Illustrations: BL0013WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the winter load line mark. You will enter the summer zone after steaming six days. You will enter the winter zone after an additional three days. You will consume 28 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.020, and the average TPI is 46. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0012 below.
64.5 inches

Illustrations: BL0012WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the winter load line mark. You will enter the summer zone after steaming one day, and you will enter the winter zone after a total of eleven days. You will consume 33 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.004, and the average TPI is 46. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0011 below.
82 inches

Illustrations: BL0011WM

You are loading in a port subject to the winter load line mark and bound for a port subject to the tropical load line mark. You will enter the summer zone after steaming four days, and you will enter the tropical zone after a total of twelve days. You will consume 39 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.025, and the average TPI is 49. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0010 below.
90 inches

Illustrations: BL0010WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the winter load line mark. You will enter the summer zone after steaming one and one-half days, and you will enter the winter zone after a total of six days. You will consume 29 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.006, and the average TPI is 43. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0008 below.
76.5 inches

Illustrations: BL0008WM

You are loading in a port subject to the winter load line mark and bound for a port subject to the tropical load line mark. You will enter the summer zone after steaming four days, and you will enter the tropical zone after a total of seven days. You will consume 38 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.004, and the average TPI is 72. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0007 below.
90 inches

Illustrations: BL0007WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the winter load line mark. You will enter the summer zone after steaming eleven days, and you will enter the winter zone after a total of fourteen days. You will consume 36 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.025, and the average TPI is 51. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0006 below.
81.0 inches

Illustrations: BL0006WM

You are loading in a port subject to the tropical load line mark and bound for a port subject to the winter load line mark. You will enter the summer zone after steaming one day, and you will enter the winter zone after a total of eight days. You will consume 36 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.002, and the TPI is 47. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0005 below.
72.7 inches

Illustrations: BL0005WM

You have 590 tons of below deck tonnage. There is no liquid mud aboard. If you have 84 tons of cargo above deck with a VCG above the deck of 2.7 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.11 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage and 100 tons of above deck cargo on board. You must load 160 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
135 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 640 tons of below deck tonnage. There is no liquid mud aboard. If you have 160 tons of cargo above deck with a VCG above the deck of 3.4 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.46 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 360 tons of below deck tonnage and 145 tons of above deck cargo on board. You must load 220 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
94 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 550 tons of below deck tonnage including liquid mud. Your existing deck cargo is 120 tons with a VCG above the deck of 2.6 feet. What is the maximum additional deck cargo tonnage you are permitted to load? See illustration D036DG below.
120 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 240 tons of below deck tonnage. There is no liquid mud aboard. If you have 360 tons of cargo above deck with a VCG above the deck of 2.9 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.60 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 520 tons of below deck tonnage including liquid mud. Your existing deck cargo is 160 tons with a VCG above the deck of 2.7 feet. What is the maximum cargo tonnage you are permitted to load? See illustration D036DG below.
84 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 600 tons of below deck tonnage. There is no liquid mud aboard. If you have 150 tons of cargo above deck with a VCG above the deck of 2.8 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.20 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage and 230 tons of above deck cargo on board. You must load 220 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
none

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 700 tons of below deck tonnage including liquid mud. Your existing deck cargo is 200 tons with a VCG above the deck of 3.0 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
20 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 520 tons of below deck tonnage. There is no liquid mud. If you have 160 tons of cargo above deck with a VCG above the deck of 3.2, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.79 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage. There is no liquid mud aboard. If you have 225 tons of cargo above deck with a VCG above the deck of 3.4 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.28 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 160 tons of below deck tonnage and 300 tons of above deck cargo on board. You must load 110 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
55 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 650 tons of below deck tonnage including liquid mud. Your existing deck cargo is 140 tons with a VCG above the deck of 2.5 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
83 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 420 tons of below deck tonnage and 150 tons of above deck cargo on board. You must load 135 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
90 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 710 tons of below deck tonnage. There is no liquid mud aboard. If you have 150 tons of cargo above deck with a VCG above the deck of 3.1 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.78 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 360 tons of below deck tonnage and 210 tons of above deck cargo on board. You must load 100 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
65 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 480 tons of below deck tonnage including liquid mud. Your existing deck cargo is 200 tons with a VCG above the deck of 2.8 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
62 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 420 tons of below deck tonnage and 180 tons of above deck cargo on board. You must load 140 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
60 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 200 tons of below deck tonnage. There is no liquid mud aboard. If you have 140 tons of cargo above deck with a VCG above the deck of 4.2 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.44 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 60 tons of below deck tonnage and 220 tons of above deck cargo on board. You must load 240 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
125 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 260 tons of below deck tonnage including liquid mud. Your existing deck cargo is 150 tons with a VCG above the deck of 2.2 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
210 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 300 tons of below deck tonnage including liquid mud. Your existing deck cargo is 180 tons with a VCG above the deck of 1.9 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
162 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 180 tons of below deck tonnage including liquid mud. Your existing deck cargo is 300 tons with a VCG above the deck of 3.0 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
100 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 640 tons of below deck tonnage. There is no liquid mud aboard. If you have 160 tons of cargo above deck with a VCG above the deck of 3.4 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.46 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 360 tons of below deck tonnage and 145 tons of above deck cargo on board. You must load 220 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
94 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 550 tons of below deck tonnage including liquid mud. Your existing deck cargo is 120 tons with a VCG above the deck of 2.6 feet. What is the maximum additional deck cargo tonnage you are permitted to load? See illustration D036DG below.
120 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 240 tons of below deck tonnage. There is no liquid mud aboard. If you have 360 tons of cargo above deck with a VCG above the deck of 2.9 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.60 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 520 tons of below deck tonnage including liquid mud. Your existing deck cargo is 160 tons with a VCG above the deck of 2.7 feet. What is the maximum cargo tonnage you are permitted to load? See illustration D036DG below.
84 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 600 tons of below deck tonnage. There is no liquid mud aboard. If you have 150 tons of cargo above deck with a VCG above the deck of 2.8 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.20 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage and 230 tons of above deck cargo on board. You must load 220 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
none

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 700 tons of below deck tonnage including liquid mud. Your existing deck cargo is 200 tons with a VCG above the deck of 3.0 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
20 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 520 tons of below deck tonnage. There is no liquid mud. If you have 160 tons of cargo above deck with a VCG above the deck of 3.2, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.79 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage. There is no liquid mud aboard. If you have 225 tons of cargo above deck with a VCG above the deck of 3.4 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.28 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 160 tons of below deck tonnage and 300 tons of above deck cargo on board. You must load 110 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
55 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 650 tons of below deck tonnage including liquid mud. Your existing deck cargo is 140 tons with a VCG above the deck of 2.5 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
83 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 420 tons of below deck tonnage and 150 tons of above deck cargo on board. You must load 135 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
90 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 710 tons of below deck tonnage. There is no liquid mud aboard. If you have 150 tons of cargo above deck with a VCG above the deck of 3.1 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.78 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 360 tons of below deck tonnage and 210 tons of above deck cargo on board. You must load 100 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
65 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 480 tons of below deck tonnage including liquid mud. Your existing deck cargo is 200 tons with a VCG above the deck of 2.8 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
62 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 420 tons of below deck tonnage and 180 tons of above deck cargo on board. You must load 140 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
60 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 200 tons of below deck tonnage. There is no liquid mud aboard. If you have 140 tons of cargo above deck with a VCG above the deck of 4.2 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.44 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 60 tons of below deck tonnage and 220 tons of above deck cargo on board. You must load 240 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
125 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 260 tons of below deck tonnage including liquid mud. Your existing deck cargo is 150 tons with a VCG above the deck of 2.2 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
210 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 300 tons of below deck tonnage including liquid mud. Your existing deck cargo is 180 tons with a VCG above the deck of 1.9 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
162 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 180 tons of below deck tonnage including liquid mud. Your existing deck cargo is 300 tons with a VCG above the deck of 3.0 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
100 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 590 tons of below deck tonnage. There is no liquid mud aboard. If you have 84 tons of cargo above deck with a VCG above the deck of 2.7 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.11 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage and 100 tons of above deck cargo on board. You must load 160 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
135 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 550 tons of below deck tonnage including liquid mud. Your existing deck cargo is 120 tons with a VCG above the deck of 2.6 feet. What is the maximum additional deck cargo tonnage you are permitted to load? See illustration D036DG below.
120 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 240 tons of below deck tonnage. There is no liquid mud aboard. If you have 360 tons of cargo above deck with a VCG above the deck of 2.9 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.60 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 520 tons of below deck tonnage including liquid mud. Your existing deck cargo is 160 tons with a VCG above the deck of 2.7 feet. What is the maximum cargo tonnage you are permitted to load? See illustration D036DG below.
84 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 600 tons of below deck tonnage. There is no liquid mud aboard. If you have 150 tons of cargo above deck with a VCG above the deck of 2.8 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.20 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage and 230 tons of above deck cargo on board. You must load 220 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
none

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 700 tons of below deck tonnage including liquid mud. Your existing deck cargo is 200 tons with a VCG above the deck of 3.0 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
20 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 520 tons of below deck tonnage. There is no liquid mud. If you have 160 tons of cargo above deck with a VCG above the deck of 3.2, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.79 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage. There is no liquid mud aboard. If you have 225 tons of cargo above deck with a VCG above the deck of 3.4 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.28 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 160 tons of below deck tonnage and 300 tons of above deck cargo on board. You must load 110 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
55 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 650 tons of below deck tonnage including liquid mud. Your existing deck cargo is 140 tons with a VCG above the deck of 2.5 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
83 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 420 tons of below deck tonnage and 150 tons of above deck cargo on board. You must load 135 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
90 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 710 tons of below deck tonnage. There is no liquid mud aboard. If you have 150 tons of cargo above deck with a VCG above the deck of 3.1 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.78 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 360 tons of below deck tonnage and 210 tons of above deck cargo on board. You must load 100 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
65 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 480 tons of below deck tonnage including liquid mud. Your existing deck cargo is 200 tons with a VCG above the deck of 2.8 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
62 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 420 tons of below deck tonnage and 180 tons of above deck cargo on board. You must load 140 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
60 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 200 tons of below deck tonnage. There is no liquid mud aboard. If you have 140 tons of cargo above deck with a VCG above the deck of 4.2 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.44 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 60 tons of below deck tonnage and 220 tons of above deck cargo on board. You must load 240 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
125 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 260 tons of below deck tonnage including liquid mud. Your existing deck cargo is 150 tons with a VCG above the deck of 2.2 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
210 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 300 tons of below deck tonnage including liquid mud. Your existing deck cargo is 180 tons with a VCG above the deck of 1.9 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
162 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 180 tons of below deck tonnage including liquid mud. Your existing deck cargo is 300 tons with a VCG above the deck of 3.0 feet. What is the maximum additional cargo tonnage you are permitted to load? See illustration D036DG below.
100 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 590 tons of below deck tonnage. There is no liquid mud aboard. If you have 84 tons of cargo above deck with a VCG above the deck of 2.7 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
3.11 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 400 tons of below deck tonnage and 100 tons of above deck cargo on board. You must load 160 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
135 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 640 tons of below deck tonnage. There is no liquid mud aboard. If you have 160 tons of cargo above deck with a VCG above the deck of 3.4 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
2.46 feet

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

You have 360 tons of below deck tonnage and 145 tons of above deck cargo on board. You must load 220 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.
94 tons

Illustrations: D036DG1_WM_072120, D036DG2_WM_072120, D036DG3_WM_072120
See REF635

Your drafts are: FWD 6'-00", AFT 6'-06". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 17 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
18 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 10 containers of rig supplies each measuring 10'L by 6'B by 6'H and weighing 1.8 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
0.94 foot

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 5'-08", AFT 6'-04". From past experience, you know that the vessel will increase her draft 1 inch for every 7 tons loaded. There is rig water on board and 10 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
25.0 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 6 containers of ship stores each measuring 8'L by 4'B by 6'H and weighing 0.5 ton each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.90 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-01", AFT 6'-10". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 11 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
12 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 50 containers of ships stores each measuring 6'L by 4'B by 3'H and weighing 0.4 ton each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
2.66 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF635

Your drafts are: FWD 5'-11", AFT 6'-11". From past experience, you know that the vessel will increase her draft 1 inch for every 7 tons loaded. There is rig water on board and 16 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
14 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 8 containers of steward's supplies each measuring 6'L by 6'B by 6'H and weighing 1.5 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.48 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-02", AFT 6'-06". From past experience, you know that the vessel will increase her draft 1 inch for every 5 tons loaded. There is rig water on board and 15 tons of deck cargo. How many more tons of cargo can legally be loaded and still maintain the same trim? See illustration D037DG below.
5 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

Your drafts are: FWD 5'-08", AFT 6'-02". From past experience, you know that the vessel will increase her draft 1 inch for every 8 tons loaded. There is rig water on board and 11 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
24 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 38 containers of ships stores each measuring 6'L by 6'B by 5'H and weighing 0.6 ton each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.06 feet (0.32 meter)

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-2", AFT 6'-8". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 23 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
6 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

Your drafts are: FWD 6'-02", AFT 6'-08". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 23 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
6 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 6 containers of rig supplies each measuring 8'L by 4'B by 3'H and weighing 1.6 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
2.18 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-01", AFT 6'-05". From past experience, you know that the vessel will increase her draft 1 inch for every 5 tons loaded. There is rig water on board and 15 tons of deck cargo. How many more tons of cargo can legally be loaded and still maintain the same trim? See illustration D037DG below.
10 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 12 containers of rig supplies each measuring 10'L by 4'B by 5'H and weighing 2.0 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
0.9 foot

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-01", AFT 6'-05". From past experience, you know that the vessel will increase her draft by 1 inch for every 7 tons loaded. There is rig water on board and 20 tons of deck cargo. How many more tons of cargo can be loaded while maintaining the same trim? See illustration D037DG below.
14.0 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 4 containers of rig supplies each measuring 8'L by 8'B by 8'H and weighing 1.2 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.68 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-00", AFT 6'-06". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 17 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
18 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 10 containers of rig supplies each measuring 10'L by 6'B by 6'H and weighing 1.8 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
0.94 foot

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 5'-08", AFT 6'-04". From past experience, you know that the vessel will increase her draft 1 inch for every 7 tons loaded. There is rig water on board and 10 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
25.0 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 6 containers of ship stores each measuring 8'L by 4'B by 6'H and weighing 0.5 ton each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.90 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-01", AFT 6'-10". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 11 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
12 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 50 containers of ships stores each measuring 6'L by 4'B by 3'H and weighing 0.4 ton each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
2.66 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF635

Your drafts are: FWD 5'-11", AFT 6'-11". From past experience, you know that the vessel will increase her draft 1 inch for every 7 tons loaded. There is rig water on board and 16 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
14 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 8 containers of steward's supplies each measuring 6'L by 6'B by 6'H and weighing 1.5 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.48 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-02", AFT 6'-06". From past experience, you know that the vessel will increase her draft 1 inch for every 5 tons loaded. There is rig water on board and 15 tons of deck cargo. How many more tons of cargo can legally be loaded and still maintain the same trim? See illustration D037DG below.
5 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

Your drafts are: FWD 5'-08", AFT 6'-02". From past experience, you know that the vessel will increase her draft 1 inch for every 8 tons loaded. There is rig water on board and 11 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
24 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 38 containers of ships stores each measuring 6'L by 6'B by 5'H and weighing 0.6 ton each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.06 feet (0.32 meter)

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-2", AFT 6'-8". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 23 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
6 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

Your drafts are: FWD 6'-02", AFT 6'-08". From past experience, you know that the vessel will increase her draft 1 inch for every 6 tons loaded. There is rig water on board and 23 tons of deck cargo. How many more tons of cargo can be loaded and still maintain the same trim? See illustration D037DG below.
6 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 6 containers of rig supplies each measuring 8'L by 4'B by 3'H and weighing 1.6 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
2.18 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-01", AFT 6'-05". From past experience, you know that the vessel will increase her draft 1 inch for every 5 tons loaded. There is rig water on board and 15 tons of deck cargo. How many more tons of cargo can legally be loaded and still maintain the same trim? See illustration D037DG below.
10 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 12 containers of rig supplies each measuring 10'L by 4'B by 5'H and weighing 2.0 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
0.9 foot

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

Your drafts are: FWD 6'-01", AFT 6'-05". From past experience, you know that the vessel will increase her draft by 1 inch for every 7 tons loaded. There is rig water on board and 20 tons of deck cargo. How many more tons of cargo can be loaded while maintaining the same trim? See illustration D037DG below.
14.0 tons

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF619

You have 4 containers of rig supplies each measuring 8'L by 8'B by 8'H and weighing 1.2 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
1.68 feet

Illustrations: D037DG1_WM_072020, D037DG2_WM_072020
See REF636

You are reading the draft marks as shown in illustration D032DG. The top 2 inches of number "9" are visible above the waterline. What is the draft?
9'-04"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The water level forward leaves about 4 inches of the 11 visible, and the water level aft is at the top of the 10. What is the mean draft?
10'-10"

Illustrations: D032DG_WM_081618

You are reading draft marks on a vessel. The water level is halfway between the bottom of the number 5 and the top of the number 5. What is the draft of the vessel?
5'-03"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The water level forward is at the top of the 8, and the mean water level aft is at the top of the 8. What is the mean draft?
8'06"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The water level is about 4 inches below the bottom of the number 11. What is the draft?
10'-08"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The water level forward is 4 inches below the 11, and the water level aft is 2 inches below the top of the 11. What is the mean draft?
11'-00"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The water level is at the top of number 8. What is the draft?
8'-06"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The top 2 inches of the 9 forward is visible above the water level, and the water level is four inches below the 10 aft. What is the mean draft?
9'-06"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The water level is at the bottom of number 11. What is the draft?
11'-00"

Illustrations: D032DG_WM_081618

You are reading the draft marks as shown in illustration D032DG. The water level is about 4 inches below the bottom of 10. What is the draft?
9'-08"

Illustrations: D032DG_WM_081618

Your vessel's drafts are: FWD 18'-09", AFT 20'-03". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
5349 tons

Illustrations: STABILITYFORMULAS

A tank which is NOT completely full or empty is called _____.
slack

Illustrations: STABILITYFORMULAS

Stability is determined principally by the location of the point of application of two forces: the downward-acting gravity force and the _____.
upward-acting buoyant force

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Your vessel's drafts are: FWD 18'-09", AFT 19'-01". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
5649 tons

Illustrations: STABILITYFORMULAS

The center of the underwater volume of a floating vessel is the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Your vessel's drafts are: FWD 13'-11", AFT 16'-05". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
7779 tons

Illustrations: STABILITYFORMULAS

A vessel's light displacement is 12,000 tons. Its heavy displacement is 28,000 tons. When fully loaded it carries 200 tons of fuel and 100 tons of water and stores. What is the cargo carrying capacity in tons?
15,700 tons

Illustrations: STABILITYFORMULAS
See REF615

A vessel's drafts are: FWD 19'-00", AFT 21'-10". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
4819 tons

Illustrations: STABILITYFORMULAS

Stability is determined principally by the location of the point of application of two forces: the upward-acting buoyant force and the _____.
downward-acting weight force

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Stable equilibrium for a vessel means that the metacenter is _____.
higher than the center of gravity

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

A tanker loads at a terminal within the tropical zone. She will enter the summer zone six days after departing the loading port. She will burn off 45 tons/day and daily water consumption is 8 tons. How many tons may she load over that allowed by her summer load line?
318

Illustrations: STABILITYFORMULAS
See REF616

A tanker's mean draft is 32'-05". At this draft, the TPI is 178. The mean draft after loading 1200 tons will be _____.
33'-00"

Illustrations: STABILITYFORMULAS

A tanker loads at a terminal within the tropical zone. She will enter the summer zone five days after departing the loading port. She will burn off about 45 tons/day and daily water consumption is 8 tons. How many tons may she load over that allowed by her summer load line?
265

Illustrations: STABILITYFORMULAS
See REF617

The TPI curve, one of the hydrostatic curves in a vessel's plans, gives the number of tons _____.
necessary to further immerse the vessel 1 inch at a given draft

Illustrations: STABILITYFORMULAS

A vessel's tropical load line is 6 in. above her summer load line. Her TPI is 127 tons. She will arrive in the summer zone 8 days after departure. She will burn off about 47 tons/day fuel and water consumption is 12 tons/day. How many tons may she load above her summer load line if she loads in the tropical zone?
472

Illustrations: STABILITYFORMULAS
See REF618

A vessel has a maximum allowable draft of 28 feet in salt water and a fresh water allowance of 8 inches. At the loading berth, the water density is 1.011. To what draft can she load in order to be at her marks when she reaches the sea? (The salt water density is 1.025.)
28' 04.5"

Illustrations: STABILITYFORMULAS

The geometric center of the underwater volume is known as the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

With no environmental forces, the center of gravity of an inclined vessel is vertically aligned with the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Your vessel has a forward draft of 26'-11" and an after draft of 29'-07". How many tons of cargo can be loaded before the vessel reaches a mean draft of 28'-06" if the TPI is 69?
207 tons

Illustrations: STABILITYFORMULAS

Your vessel is floating in water of density 1.010. The fresh water allowance is 8 inches. How far below her marks may she be loaded so as to float at her mark in saltwater of density 1.025?
4.8 inches

Illustrations: STABILITYFORMULAS

Stability is determined by the relationship of the center of gravity and the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS

See REF133

A vessel's mean draft is 29'-07". At this draft, the TPI is 152. The mean draft after loading 1360 tons will be _____.
30'-04"

Illustrations: STABILITYFORMULAS
See REF615

A bulk freighter 680 ft. in length, 60 ft. beam, with a waterplane coefficient of .84, is floating in salt water at a draft of 21'. How many long tons would it take to increase the mean draft by 1"?
81.6 tons

Illustrations: STABILITYFORMULAS

A vessel's drafts are: FWD 14'-04", AFT 15'-08". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
7879 tons

Illustrations: STABILITYFORMULAS

Stability is determined principally by the location of the center of gravity and the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The geometric center of the underwater volume of a floating vessel is the center of _____.
buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

A bulk freighter 680 ft. in length, 60 ft. beam, with a waterplane coefficient of .84, is floating in salt water at a draft of 21'. How many long tons would it take to increase the mean draft by 1"?
69.6

Illustrations: STABILITYFORMULAS

With no environmental forces, the center of gravity of an inclined vessel is vertically aligned directly above the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

A vessel's drafts are: FWD 19'-00", AFT 17'-02". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
6149 tons

Illustrations: STABILITYFORMULAS

Your vessel's drafts are: FWD 14'-04", AFT 12'-08". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
8699 tons

Illustrations: STABILITYFORMULAS

Stability is determined principally by the location of two points in a vessel: The center of buoyancy and the _____.
center of gravity

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

In order to calculate the TPI of a vessel, for any given draft, it is necessary to divide the area of the waterplane by _____.
420

Illustrations: STABILITYFORMULAS

The center of volume of the immersed portion of the hull is called the _____.
center of buoyancy

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

The geometric center of the waterplane area is called the _____.
center of flotation

Illustrations: STABILITYDIAGRAM1, STABILITYDIAGRAM2, STABILITYFORMULAS
See REF133

Your vessel's drafts are: FWD 13'-11", AFT 11'-09". How much more cargo can be loaded to have the vessel down to the freeboard draft? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
9069 tons

Illustrations: STABILITYFORMULAS

Pitching is angular motion of the vessel about what axis?
Transverse

Illustrations: PITCH_ROLL_YAW
See REF037

Rolling is angular motion of the vessel about what axis?
Longitudinal

Illustrations: PITCH_ROLL_YAW
See REF037

Angular motion about the longitudinal axis of a vessel is known as _____.
roll

Illustrations: PITCH_ROLL_YAW
See REF037

The horizontal fore-and-aft movement of a vessel is called _____.
surge

Illustrations: PITCH_ROLL_YAW
See REF037

Horizontal fore or aft motion of a vessel is known as _____.
surge

Illustrations: PITCH_ROLL_YAW
See REF037

The horizontal port or starboard movement of a vessel is called _____.
sway

Illustrations: PITCH_ROLL_YAW
See REF037

Horizontal transverse motion of a vessel is known as _____.
sway

Illustrations: PITCH_ROLL_YAW
See REF037

The angular movement of a vessel about a horizontal line drawn from its bow to its stern is _____.
rolling

Illustrations: PITCH_ROLL_YAW
See REF037

Angular motion about the vertical axis of a vessel is called _____.
yaw

Illustrations: PITCH_ROLL_YAW
See REF037

The vertical motion of a floating vessel is known as _____.
heave

Illustrations: PITCH_ROLL_YAW
See REF037

The vertical motion of a floating vessel in which the entire hull is lifted by the force of the sea is known as _____.
heave

Illustrations: PITCH_ROLL_YAW
See REF037

Yawing is angular motion of the vessel about what axis?
Vertical

Illustrations: PITCH_ROLL_YAW
See REF037

Heave is motion along the _____.
vertical axis

Illustrations: PITCH_ROLL_YAW
See REF037

What is NOT a motion of the vessel?
Trim

Illustrations: PITCH_ROLL_YAW
See REF037

Your vessel displaces 479 tons. The existing deck cargo has a center of gravity of 3.0 feet above the deck and weighs 16 tons. If you load 23 tons of anchor and anchor chain with an estimated center of gravity of 9 inches above the deck, what is the final height of the CG above the deck?
1.67 feet
See REF610

The SS AMERICAN MARINER has drafts of: FWD 25'-11", AFT 26'-11". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 83 tons of seawater.
FWD 26'-06.8", AFT 26'-06.3"

A weight of 350 tons is loaded on your vessel 85 feet forward of the tipping center. The vessel's MT1 is 1150 foot-tons. What is the total change of trim?
25.87 inches

Your vessel's drafts are FWD 24'-02", AFT 24'-04". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 295 tons of cargo are loaded 122 feet aft of amidships.
FWD 23'-04", AFT 26'-03"

Your vessel's drafts are: FWD 14'-00", AFT 14'-08"; and the KG is 25.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 30° inclination if the center of gravity is 1.5 feet off the centerline.
0.6 foot

Your vessel's drafts are: FWD 27'-06", AFT 28'-02"; and the KG is 21.3 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 15° inclination.
1.5 feet

Your vessel's drafts are: FWD 24'-04", AFT 25'-10"; and the KG is 23.5 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 37° inclination.
2.1 feet

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability and number 4 hold floods, the vessel will sink if the permeability exceeds what percent?
60 (%)

On a vessel of 6500 tons displacement, a tank 30 ft. long, 32 ft. wide and 18 ft. deep is half filled with liquid cargo (S.G. 1.048) while the vessel is floating in saltwater (S.G. 1.026). What is the free surface constant for this tank?
2390
See REF621

On a vessel of 15,000 tons displacement, compute the reduction in metacentric height due to free surface in a hold having free water in the tank tops. The hold is 50 feet long and 60 feet wide. What is the reduction in metacentric height?
1.71 feet
See REF621

Your vessel displaces 740 tons and measures 141'L by 34'B. What is the reduction in GM due to free surface if the fish hold (41'L by 30'B by 9'D) is filled with 2.5 feet of water? (Each foot of water weighs 35.1 tons)
3.18 feet

To check stability, a weight of 35 tons is lifted with the jumbo boom, whose head is 35 feet from the ship's centerline. The clinometer shows a list of 7.0° with the weight suspended. Displacement including the weight is 14,000 tons. What would the length of GM in this condition?
0.71 foot

Your sailing drafts are: FWD 17'-07", AFT 18'-03" and the GM is 2.8 feet. What will be the angle of list if the #4 starboard double bottom (capacity 141 tons, VCG 2.6 feet, and 23.8 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
8°

If your vessel has a GM of one foot and a breadth of 50 feet, what is your vessel's estimated rolling period?
22 seconds

You have approximately 14 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 6 feet? (total displacement is 210 tons)
0.4 foot
See REF639

You are hoisting a heavy lift with the jumbo boom. Your vessel displaces 5230 T. The 35-ton weight is on the pier and its center is 60' to starboard of the centerline. The head of the boom is 105' above the base line and the center of gravity of the lift when stowed on deck will be 42' above the base line. As the jumbo boom takes the strain the ship lists to 5°. What is the GM with the cargo stowed?
4.98

The wind has caused a difference between drafts starboard and port. This difference is known as which of the following?
heel
See REF834

A vessel is equipped with cross-connected deep tanks. In which situation should the cross-connection valve be closed?
The tanks are partially filled with liquid cargo.

In small-angle stability, when external forces exist, the buoyant force is assumed to act vertically upwards through the center of buoyancy and through the _____.
metacenter
See REF133

In the absence of external forces, the center of gravity of a floating vessel is located directly in line with the _____.
geometric center of the displaced volume
See REF839

Aboard a vessel, dividing the sum of the transverse moments by the total weight yields the vessel's _____.
transverse position of the center of gravity
See REF849

If your vessel will list with equal readiness to either side, the list is most likely caused by _____.
negative GM

When the height of the metacenter is greater than the height of the center of gravity, a vessel is in _____.
stable equilibrium

The difference between the height of the metacenter and the height of the center of gravity is known as the _____.
metacentric height

If the metacentric height is large, a vessel will _____.
be stiff

A vessel is inclined at an angle of loll. In the absence of external forces, the righting arm (GZ) is _____.
zero
See REF836

Which action will best increase the transverse stability of a merchant vessel at sea?
Ballasting the double bottom tanks

When making a turn (course change) on most merchant ships, the vessel will heel outwards if _____.
G is above the center of lateral resistance

Aboard a vessel, dividing the sum of the longitudinal moments by the total weight yields the vessel's _____.
longitudinal position of the center of gravity
See REF131

When a vessel's LCG is aft of her LCB, the vessel will _____.
trim by the stern

If a vessel is sagging, which kind of stress is placed on the sheer strake?
Compression

The tendency of a vessel to return to its original trim after being inclined by an external force is _____.
longitudinal stability

Your vessel displaces 475 tons. The existing deck cargo has a center of gravity of 2.6 feet above the deck and weighs 22 tons. If you load 16 tons of ground tackle with an estimated center of gravity of 8 inches above the deck, what is the final height of the CG of the deck cargo?
1.79 feet
See REF611

The SS AMERICAN MARINER has drafts of: FWD 22'-03", AFT 24'-00". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 100.7 tons of seawater.
FWD 23'-01.0", AFT 23'-05.7"

Your vessel's drafts are: FWD 27'-09", AFT 28'-03"; and the KG is 22.4 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the angle of list if the center of gravity is shifted 1.6 feet off the centerline.
24°

Your vessel's drafts are FWD 19'-02", AFT 23'-10". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 98 tons of fuel is loaded 116 feet forward of amidships.
FWD 19'-09", AFT 23'-06"

Your vessel's drafts are: FWD 19'-09", AFT 20'-09"; and the KG is 24.6 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 15° inclination if the center of gravity is 0.5 foot off the centerline.
0.0 feet

The sailing drafts are: FWD 22'-08", AFT 23'-04" and the GM is 4.6 feet. Use the information in Section 1, the blue pages, of the Stability Data Reference Book, to determine the available righting arm at 20° inclination.
2.1 feet

Your vessel's drafts are: FWD 17'-05", AFT 20'-01"; and the KG is 25.6 feet. What is the righting moment when the vessel is inclined to 45°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
19,709 foot-tons

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability and number 3 hold floods, the vessel will sink if the permeability exceeds what percent?
78 (%)

On a vessel of 6500 tons displacement, a tank 35 ft. long, 25 ft. wide, and 8 ft. deep is half filled with liquid cargo (S.G. 1.053) while the vessel is floating in saltwater (S.G. 1.026). What is the free surface constant for this tank?
1336
See REF621

On a vessel of 10,000 tons displacement, compute the reduction in metacentric height due to free surface in a hold having free water on the tank top. The hold is 40 feet long and 50 feet wide. What is the reduction in metacentric height?
1.2 feet
See REF621

Your vessel displaces 645 tons and measures 132'L by 34'B. What is the reduction in GM due to free surface if the fish hold (30'L by 26'B by 8'D) is filled with 3.0 feet of water? (Each foot of water weighs 22.3 tons)
1.76 feet
See REF631

To check stability, a weight of 40 tons is lifted with the jumbo boom, whose head is 40 feet from the ship's centerline. The clinometer shows a list of 6.5° with the weight suspended. Displacement including weight is 16,000 tons. What would be the GM while in this condition?
0.88 foot

A cargo of 30 tons is to be loaded on deck 30 feet from the ship's centerline. The ship's displacement including the 30 tons cargo will be 9,000 tons and the GM will be 5 feet. What would be the list of the vessel after loading this cargo?
1.14°

Your vessel has a metacentric height of 1.12 feet and a beam of 60 feet. What will your average rolling period be?
25 seconds

Your vessel's drafts are: FWD 21'-08", AFT 24'-02". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 15 inches? (Use the selected stability curves in Section 1, the blue pages, of the Stability Data Reference Book)
82 tons
See REF640

You are making a heavy lift with the jumbo boom. Your vessel displaces 8390 T. The 40 ton weight is on the pier and its center is 55' to starboard of the centerline. The head of the boom is 110' above the base line and the center of gravity of the lift when stowed on deck will be 45' above the base line. As the jumbo boom takes the strain the ship lists to 3.5°. What is the GM with the cargo stowed?
4.58 feet

What is the difference between the starboard and port drafts due to the wind or seas called?
heel
See REF834

Reducing the liquid free surfaces in a vessel reduces the _____.
roll period

Which will improve stability?
Pumping the bilges

A vessel behaves as if all of its weight is acting downward through the center of gravity, and all its support is acting upward through the _____.
center of buoyancy
See REF133

Aboard a vessel, dividing the sum of the vertical moments by the total weight yields the vessel's _____.
height of the center of gravity
See REF850

A vessel continually lists to one side and has a normal rolling period. Which statement is TRUE?
The vessel has asymmetrical weight distribution.

For small angles of inclination, if the KG were equal to the KM, then the vessel would have _____.
neutral stability

When initial stability applies, the height of the center of gravity plus the metacentric height equals the _____.
height of the metacenter

When the height of the metacenter is the same as the height of the center of gravity, the metacentric height is equal to _____.
zero

Transverse stability calculations require the use of _____.
hydrostatic curves

The center of buoyancy and the metacenter are in the line of action of the buoyant force _____.
at all times
See REF133

Which statement is TRUE of a stiff vessel?
She will have a large metacentric height.
See REF853

Which describes how to determine a vessel's LCG?
dividing the total longitudinal moment summations by displacement
See REF131

The two points that act together to trim a ship are the _____.
LCG and LCB

When a vessel is stationary and in a hogging condition, the main deck is under _____.
tension stress

Your vessel displaces 528 tons. The existing cargo has a center of gravity of 2.9 feet above the deck and weighs 28 tons. If you load 14 tons of ground tackle with an estimated center of gravity of 9 inches above the deck, what is the final height of the CG of the deck cargo?
2.18 feet

The SS AMERICAN MARINER has drafts of: FWD 22'-03", AFT 26'-05". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 77 tons of seawater.
FWD 22'-10.5", AFT 26'-00.4"

A vessel's drafts are: FWD 16'-03", AFT 16'-09"; and the KG is 21.3 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the angle of list if the center of gravity is shifted 2 feet off the centerline.
20°

Your vessel's drafts are FWD 19'-03", AFT 21'-07". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 142 tons of cargo are loaded 86 feet forward of amidships.
FWD 19'-11", AFT 21'-04"

Your vessel's drafts are: FWD 21'-04", AFT 21'-08"; and the KG is 20.6 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 45° inclination if the center of gravity is 1.2 feet off the centerline.
4.4 feet

The sailing drafts are: FWD 24'-03", AFT 25'-03" and the GM is 5.5 feet. Use the information in Section 1, the blue pages of the Stability Data Reference Book, to determine the available righting arm at 30° inclination.
3.5 feet

Your vessel's drafts are: FWD 24'-07", AFT 25'-09"; and the KG is 23.2 feet. What is the righting moment when the vessel is inclined to 45°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
34,663 foot-tons

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability and number 2 hold floods, the vessel will sink if the permeability exceeds what percent?
67 (%)

On a vessel of 7000 tons displacement, a tank 35 ft. long, 30 ft. wide and 4 ft. deep is half filled with fuel oil (S.G. 0.962) while the vessel is floating in saltwater (S.G. 1.026). What is the free surface constant for this tank?
2109
See REF621

On a vessel of 12,000 tons displacement, a tank 60 feet long, 50 feet wide, and 20 feet deep is half filled with fresh water (SG 1.000) while the vessel is floating in saltwater (SG 1.026) What is the reduction in metacentric height due to free surface?
1.44 ft.
See REF621

Your vessel displaces 728 tons and measures 138'L by 31'B. What is the reduction in GM due to free surface if the fish hold (36'L by 29'B by 9'D) is filled with 3.6 feet of water? (Each foot of water weighs 29.8 tons)
2.50 feet

To check stability, a weight of 10 tons is lifted with the jumbo boom whose head is 45 ft. from the ship's centerline. The clinometer show's a list of 5.0° with weight suspended. Displacement including the weight is 9,000 tons. What would be the GM in this condition?
0.57 foot

A cargo of 60 tons is to be loaded on deck 20 feet from the ship's centerline. The vessel's displacement including the 60 ton cargo will be 6,000 tons and the GM two feet. What would be the list of the vessel after loading this cargo?
5.72°

You are on a vessel that has a metacentric height of 1.0 foot and a beam of 40 feet. What can you expect the rolling period of the vessel to be?
17.6 seconds

Your vessel is limited to a maximum draft of 27'-06". The present drafts are: FWD 24'-10", AFT 26'-00". How much more cargo can be loaded and where should it be located if a drag of 1 foot is desired? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
950 tons 2.5 feet forward of the tipping center

You are making a heavy lift with the jumbo boom. Your vessel displaces 8530 T. The 40-ton weight is on the pier and its center is 65' to starboard of the centerline. The head of the boom is 115' above the base line and the center of gravity of the lift when stowed on deck will be 50' above the base line. As the jumbo boom takes the strain the ship lists to 5°. What is the GM with the cargo stowed?
3.77 ft

What is the distance between the bottom of the hull and the waterline called?
draft

The correction to KG for longitudinal free surface effects for a vessel can be found by dividing the vessel's displacement into the _____.
sum of the longitudinal free surface moments of the vessel

An upright vessel has negative GM. GM becomes positive at the angle of loll because the _____.
effective beam is increased causing BM to increase
See REF836

The value of the maximum righting arm depends on the position of the center of buoyancy and the _____.
vertical location of the center of gravity
See REF133

The center of flotation of a vessel is _____.
the center of gravity of the water plane
See REF133

The static stability curve for a given vessel peaks at 34°. For this ship, the danger angle for a permanent list would be about _____.
17°

The original equilibrium position is stable when _____.
metacentric height is positive

The difference between the height of the metacenter and the height of the center of gravity is _____.
GM

With no environmental forces acting on the vessel, the center of gravity of an inclined vessel is vertically aligned with the _____.
metacenter

The amount of freeboard which a ship possesses has a tremendous effect on its _____.
stability at large angles of inclination

The vertical distance between G and M is used as a measure of _____.
initial stability

A quick and rapid motion of a vessel in a seaway is an indication of a(n) _____.
large GM

Longitudinal moment is obtained by multiplying a vessel's weight and its _____.
LCG

If a vessel is sagging, what kind of stress is placed on the sheer strake?
Compression

Your vessel displaces 564 tons. The existing deck cargo has a center of gravity of 1.5 feet above the deck and weighs 41 tons. If you load 22 tons of ground tackle with an estimated center of gravity of 2.5 feet above the deck, what is the final height of the CG of the deck cargo?
1.85 feet
See REF612

The SS AMERICAN MARINER has drafts of: FWD 28'-00", AFT 30'-04". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 110.8 tons of seawater.
FWD 28'-09.8", AFT 29' 10.4"

Your vessel's drafts are: FWD 17'-09", AFT 18'-03"; and the KG is 22.4 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the angle of list if the center of gravity is shifted 1.5 feet off the centerline.
22°

Your vessel's drafts are: FWD 22'-04", AFT 21'-06". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if: (1) 300 tons are loaded 122 feet forward of amidships; (2) 225 tons are loaded 150 feet aft of amidships; and 122 tons of fuel are pumped 72 feet aft.
FWD 22'-11", AFT 22'-09"

Your vessel's drafts are: FWD 23'-01", AFT 24'-05"; and the KG is 22.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 30° inclination if the center of gravity is 1.9 feet off the centerline.
0.7 foot

The sailing drafts are: FWD 16'-06", AFT 17'-04" and the GM is 2.6 feet. Use the information in Section 1, the blue pages, of the Stability Data Reference Book, to determine the available righting arm at 15° inclination.
0.8 foot

Your vessel's drafts are: FWD 17'-05", AFT 20'-01"; and the KG is 22.4 feet. What is the righting moment when the vessel is inclined to 15°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
10,656 foot-tons

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability and number 1 hold floods, the vessel will sink if the permeability exceeds what percent?
71 (%)

What is the reduction in metacentric height due to free surface when a tank 60 feet long and 30 feet wide is partially filled with salt water, and is fitted with a centerline bulkhead? (The vessel has a displacement of 10,000 tons.)
0.1 foot
See REF622

A 7,000 ton displacement tankship carries two slack tanks of alcohol with a S.G. of 0.8. Each tank is 50 ft. long and 30 ft. wide. What is the reduction in GM due to free surface with the vessel floating in sea water, S.G. is 1.026?
.72 ft
See REF628

Your vessel displaces 750 tons and measures 151'L by 35'B. What is the reduction in GM due to free surface if the fish hold (60'L by 31'B by 10'D) is filled with 3.5 feet of water? (Each foot of water weighs 53.1 tons)
4.55 feet

In order to check your vessel's stability, a weight of 40 tons is lifted with the jumbo boom, the boom head being 50 feet from the ship's centerline. The clinometer is then carefully read and shows a list of 5°. The vessel's displacement is 8,000 tons including the suspended weight. What will be the metacentric height of the vessel at this time?
2.86 feet

The SS AMERICAN MARINER is partially loaded with a GM of 2.9 feet and drafts of: FWD 17'-10", AFT 19'-04". Use the white pages of the Stability Data Reference Book to determine what tanks you should ballast to increase the GM to 3.9 feet.
Tanks: DB4, DT6

Your vessel has a displacement of 19,800 tons. It is 464 feet long, and has a beam of 64 feet. You have timed its rolling period to be 21.0 seconds in still water. What is your vessel's approximate GM?
1.8 ft
See REF637

Your vessel is limited to a maximum draft of 26'-03". The present drafts are: FWD 22'-10", AFT 23'-08". How much more cargo can be loaded and where should it be located if a drag of 18 inches is desired? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
1323 tons 7 feet aft of the tipping center

You are making a heavy lift with the jumbo boom. Your vessel displaces 7940 T. The 45-ton weight is on the pier and its center is 60' to starboard of the centerline. The head of the boom is 110' above the base line and the center of gravity of the lift when stowed on deck will be 50' above the base line. As the jumbo boom takes the strain the ship lists to 4.5°. What is the GM with the cargo stowed?
4.64

What is the weight of the liquid displaced by a vessel floating in sea water equal to?
total weight of the vessel
See REF615

The correction to KG for transverse free surface effects may be found by dividing the vessel's displacement into the _____.
sum of the transverse free surface moments of the vessel

At an angle of loll, the capsizing moment is _____.
zero
See REF837

The upward pressure of displaced water is called _____.
buoyancy
See REF133

The center of flotation of a vessel is the point in the waterplane _____.
about which the vessel lists and trims
See REF133

The value of the righting arm at an angle of loll is _____.
negative

If the cause of a sudden severe list or trim is negative initial stability, counter-flooding into empty tanks may cause which of the following?
decrease list

A neutral equilibrium position for a vessel means that the metacenter is _____.
at the same height as the center of gravity

A negative metacentric height _____.
should always be immediately corrected
See REF852

The moment created by a force of 12,000 tons and a moment arm of 0.25 foot is _____.
3,000 ft-tons

The change in weight (measured in tons) which causes a draft change of one inch is _____.
TPI

Unstable equilibrium exists at small angles of inclination when _____.
G is above M

A slow and easy motion of a vessel in a seaway is an indication of a _____.
small GM

The LCG of a vessel may be found by dividing displacement into the _____.
sum of the longitudinal moments of the vessel

Your vessel has a midships engine room and the cargo is concentrated in the end holds. The vessel is _____.
hogging with tensile stress on main deck

The SS AMERICAN MARINER has drafts of: FWD 29'-04", AFT 30'-06". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 101.6 tons of seawater.
FWD 30'-00.8", AFT 30'-01.0"

Your vessel displaces 560 tons. The existing deck cargo has a center of gravity of 4.5 feet above the deck and weighs 34 tons. If you load 10 tons of ground tackle with an estimated center of gravity of 2.8 feet above the deck, what is the final height of the CG of the deck cargo?
4.11 feet

The SS AMERICAN MARINER has drafts of: FWD 22'-03", AFT 25'-05". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 97 tons of seawater.
FWD 23'-00.5", AFT 24'-11.1"

Your vessel's drafts are: FWD 21'-09", AFT 23'-03"; and the KG is 20.0 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the angle of list if the center of gravity is shifted 1.9 feet off the centerline.
19°

Your vessel's drafts are FWD 24'-09", AFT 27'-01". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 122 tons are discharged 76 feet aft of amidships, 128 tons are discharged 54 feet forward of amidships, and 68 tons of fuel is pumped 48 feet aft.
FWD 24'-04", AFT 26'-08"

Your vessel's drafts are: FWD 17'-07", AFT 16'-09"; and the KG is 21.5 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 30° inclination if the center of gravity is 0.9 foot off the centerline.
2.8 feet

The sailing drafts are: FWD 23'-02", AFT 24'-06" and the GM is 2.8 feet. Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the available righting arm at 30° inclination.
2.5 feet

Your vessel's drafts are: FWD 14'-11", AFT 16'-01"; and the KG is 24.4 feet. What is the righting moment when the vessel is inclined to 30°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
18,240 foot-tons

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 24.0 feet, and the drafts are: FWD 28'-01", AFT 28'-06"; at what angle will the vessel lose positive stability?
71°

On a vessel of 9,000 tons displacement, compute the reduction in metacentric height due to free surface in a hold having free water on the tank tops. The hold is 20 feet long and 30 feet wide. What is the reduction in metacentric height?
.14 feet
See REF621

What is the reduction in metacentric height due to free surface when a tank 60 ft. wide and 60 ft. long is partially filled with saltwater? (The vessel's displacement is 10,000 tons.)
3.09 feet
See REF629

Your vessel displaces 930 tons and measures 156'L by 38'B. What is the reduction in GM due to free surface if the fish hold (46'L by 28'B by 8'D) is filled with 1.5 feet of water? (Each foot of water weighs 36.8 tons)
2.44 feet
See REF632

Your sailing drafts are: FWD 17'-07", AFT 18'-05" and the GM is 3.4 feet. What will be the angle of list if #4 port double bottom (capacity 140 tons, VCG 2.6 feet, and 26 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
6°

The SS AMERICAN MARINER is partially loaded with a GM of 3.1 feet and drafts of: FWD 19'-06", AFT 21'-04". Use the white pages of the Stability Data Reference Book to determine what tank(s) you should ballast to increase the GM to 3.7 feet.
Tanks: DB3, DT8

You are at sea on a vessel that has a beam of 50 feet, and you calculate the period of roll to be 22 seconds. What is the vessel's metacentric height?
1.0 ft
See REF637

Your vessel's has a beam of 60 feet, and you observe a still water rolling period of 25 seconds. What is the vessel's metacentric height?
1.1 ft
See REF637

Your vessel's drafts are: FWD 23'-10", AFT 26'-00". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 1 foot? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
79 tons

You are making a heavy lift with the jumbo boom. Your vessel displaces 18,000 T. The 50-ton weight is on the pier, and its center is 75 feet to starboard of the centerline. The head of the boom is 112 feet above the base line, and the center of gravity of the lift when stowed on deck will be 56 feet above the base line. As the jumbo boom takes the strain, the ship lists 3.5°. What is the GM when the cargo is stowed?
3.56 feet

The term displacement refers to which of the following?
number of long tons of water displaced by a vessel afloat

See REF615

To calculate the free surface correction, it is necessary to divide the free-surface moments by the _____.
total displacement

In small angle stability theory, the metacenter is located at the intersection of the inclined vertical centerline and a vertical line through _____.
B
See REF838

What abbreviation represents the height of the center of buoyancy?
KB
See REF842

At all angles of inclination, the metacenter is _____.
vertically above the center of buoyancy
See REF843

When inclined to an angle of list, the value of the righting arm is _____.
zero

If the cause of a sudden severe list or trim is negative initial stability, counterflooding into empty tanks may _____.
cause the unit to flop to a greater angle

The point to which your vessel's center of gravity (G) may rise and still permit the vessel to have positive stability is called the _____.
metacenter

A negative metacentric height _____.
should always be immediately corrected
See REF852

A moment of 300 ft-tons is created by a force of 15,000 tons. What is the moment arm?
0.02 foot

The enclosed area defined as the intersection of the surface of the water and the hull of a vessel is the _____.
waterplane

If the vertical center of gravity (VCG) of a ship rises, the righting arm (GZ) for the various angles of inclination will _____.
decrease

Vessels "A" and "B" are identical; however, "A" is more tender than "B". This means that "A" relative to "B" has a _____.
smaller GM

A vessel trimmed by the stern has a _____.
drag
See REF855

Which is the MOST important consideration for a tank vessel?
The stress on the hull

The maximum draft of the SS AMERICAN MARINER cannot exceed 28'-08" in order to cross a bar. The present drafts are: FWD 28'-00", AFT 29'-00". Use the white pages of the Stability Data Reference Book to determine the minimum amount of sea water to ballast the forepeak to achieve this condition.
76.7 tons

Your vessel displaces 641 tons. The existing deck cargo has a center of gravity of 3.6 feet above the deck and weighs 36 tons. If you load 22 tons of ground tackle with an estimated center of gravity of 2.0 feet above the deck, what is the final height of the CG of the deck cargo?
2.99 feet

The SS AMERICAN MARINER has drafts of: FWD 18'-07", AFT 23'-03". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 92 tons of seawater.
FWD 19'-04.9", AFT 22'-08.7"

Your vessel's drafts are: FWD 14'-11", AFT 15'-09"; and the KG is 18.2 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the angle of list if the center of gravity is shifted 2.0 feet off the centerline.
12°

You are scheduled to load 3900 tons of cargo, 45 tons of crew effects and stores and 259 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in fresh water.
17'-11"

Your vessel's drafts are: FWD 24'-06", AFT 25'-04"; and the KG is 17.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 75° inclination if the center of gravity is 2.5 feet off the centerline.
5.4 feet

The sailing drafts are: FWD 14'-08", AFT 15'-06" and the GM is 4.8 feet. Use the information in Section 1, the blue pages, of the Stability Data Reference Book, to determine the available righting arm at 40° inclination.
4.3 feet

Your vessel's drafts are: FWD 22'-03", AFT 22'-09"; and the KG is 23.2 feet. What is the righting moment when the vessel is inclined to 30°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
25,520 foot-tons

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 25.2 feet, and the drafts are: FWD 27'-11", AFT 28'-09"; at what angle will the vessel lose positive stability?
54°

On a vessel of 12,500 tons displacement, compute the reduction in metacentric height due to free surface in a hold having free water on the tank top. The hold is 35 feet long and 50 feet wide. What is the reduction in metacentric height?
.83 ft
See REF621

A vessel carries three slack tanks of gasoline (SG .68). The vessel's displacement is 8,000 tons. Each tank is 50 ft. long and 20 ft. wide. What is the reduction in GM due to free surface with the vessel floating in sea water (SG 1.026)?
.24 feet

Your vessel displaces 585 tons and measures 128'L by 26'B. What is the reduction in GM due to free surface if the fish hold (30'L by 18'B by 9'D) is filled with 2.8 feet of water? (Each foot of water weighs 15.4 tons)
0.66 foot
See REF633

A cargo of 40 tons is to be lifted with a boom located 40 feet from the ship's centerline. The ship's displacement including the suspended cargo is 8,000 tons and the GM is 2 feet with cargo suspended. What will the list of the vessel be with the cargo suspended?
5.7°

The SS AMERICAN MARINER is partially loaded with a GM of 3.1 feet and drafts of: FWD 16'-00", AFT 18'-04". Use the white pages of the Stability Data Reference Book to determine what tank(s) you should ballast to increase the GM to 3.6 feet.
Tank: DB3

Your vessel measures 114 feet long by 16 feet in beam. If the natural rolling period at a draft of 5'-06" is 6 seconds, what is the GM?
1.38 feet
See REF637

Your vessel's has a beam of 40 feet, and you observe a still water rolling period of 20 seconds. What is the vessel's metacentric height?
0.8 ft.
See REF637

Your vessel's drafts are: FWD 21'-08", AFT 24'-02". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 18 inches? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
65 tons

Which statement about the free surface effect is TRUE?
It decreases at increased angles of heel due to pocketing when a tank is 90% full.
See REF136

Increasing the number of slack liquid tanks has the effect of raising the _____.
virtual height of the center of gravity

In the absence of external forces, adding weight on one side of a floating vessel causes the vessel to _____.
list until the center of buoyancy is aligned vertically with the center of gravity
See REF839

The difference between the forward and aft drafts is _____.
trim

Before counterflooding to correct a list, you must be sure the list is due to which of the following choices?
off-center weight

What is the definition of transverse metacenter?
The point to which G may rise and still permit the vessel to possess positive stability.

A negative metacentric height _____.
should always be immediately corrected
See REF852

The result of multiplying a weight by a distance is a _____.
moment

The waterplane area is described as the intersection of the surface of the water in which a vessel floats and the _____.
hull

When stability of a vessel is neutral, the value of GM _____.
is zero

In order to minimize the effects of a tender vessel, when carrying a cargo of lumber, you should _____.
place the heaviest woods in the lower holds

A ship's forward draft is 22'-04" and its after draft is 23'-00". The draft amidships is 23'-04". This indicates a concentration of weight _____.
amidships

The normal tendency for a loaded tanker is to _____.
sag

The maximum draft of the SS AMERICAN MARINER cannot exceed 30'-01" in order to cross a bar. The present drafts are: FWD 29'-04", AFT 30'-06". Use the white pages of the Stability Data Reference Book to determine the minimum amount of sea water to ballast the forepeak to achieve this condition.
100 tons

Your vessel displaces 640 tons. The existing deck cargo has center of gravity of 2.3 feet above the deck and weighs 18 tons. If you load 12 tons of ground tackle with an estimated center of gravity of 21 inches above the deck, what is the final height of the CG of the deck cargo?
2.08 feet

The SS AMERICAN MARINER has drafts of: FWD 13'-05", AFT 21'-03". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 88 tons of seawater.
FWD 14'-02.4", AFT 20'-08.7"

Your vessel's drafts are: FWD 14'-04", AFT 15'-02"; and the KG is 23.2 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the angle of list if the center of gravity is shifted 1.0 foot off the centerline.
12°

You are scheduled to load 3900 tons of cargo, 45 tons of crew effects and stores and 359 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in fresh water.
18'-01"

Your vessel's drafts are: FWD 18'-09", AFT 20'-05"; and the KG is 23.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 26° inclination if the center of gravity is 1.0 foot off center.
0.8 foot

The sailing drafts are: FWD 23'-10", AFT 25'-02" and the GM is 5.3 feet. Use the information in Section 1, the blue pages, of the Stability Data Reference Book, to determine the available righting arm at 18° inclination.
1.9 feet

Your vessel's drafts are: FWD 14'-11", AFT 16'-01"; and the KG is 23.2 feet. What is the righting moment when the vessel is inclined to 15°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
9,272 foot-tons

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 25.8 feet, and the drafts are: FWD 15'-02", AFT 15'-10"; at what angle will the vessel lose positive stability?
73°

A cargo vessel of 9,000 tons displacement is carrying a slack deep tank of molasses (SG 1.4). The tank measures 20 feet long and 30 feet wide. What will be the reduction in metacentric height due to free surface, with the vessel floating in sea water (SG 1.026)?
.195 ft.

A shaft alley divides a vessel's cargo hold into two tanks, each 25 ft. wide by 50 ft. long. Each tank is filled with salt water below the level of the shaft alley. The vessel's displacement is 6,000 tons. What is the reduction in GM due to free surface effect?
.62 foot

Your vessel displaces 684 tons and measures 132'L by 31'B. What is the reduction in GM due to free surface if the fish hold (32'L by 29'B by 9'D) is filled with 2 feet of water? (Each foot of water weighs 26.5 tons)
2.52 feet
See REF634

Your sailing drafts are: FWD 22'-04", AFT 23'-06" and the GM is 3.2 feet. What will be the angle of list if #3 starboard double bottom (capacity 97 tons, VCG 2.5 feet and 23 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
3°

The SS AMERICAN MARINER is partially loaded with a GM of 2.6 feet and drafts of: FWD 13'-07", AFT 15'-01". Use the white pages of the Stability Data Reference Book to determine what tanks you should ballast to increase the GM to 3.4 feet.
Tanks: DB6, DB7, DT7

Your vessel measures 127 feet long by 17 feet in beam. If the natural rolling period at a draft of 7'-10" is 5 seconds, what is the GM?
2.24 feet
See REF637

You are loading cargo on deck aboard a vessel whose beam is 60 feet and full period of roll is 20 seconds. What is the estimated metacentric height of the vessel?
1.7 ft
See REF637

A vessel is limited to a maximum draft of 26'-03". The present drafts are: FWD 21'-04", AFT 24'-06". How much more cargo can be loaded and where should it be located if a drag of 1 foot is desired? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
1676 tons 18 feet forward of the tipping center

Which statement about the free surface correction is TRUE?
The correction decreases as the draft increases
See REF136

What is the principal danger from the liquid in a half full tank onboard a vessel?
Loss of stability from free surface effect

If a vessel lists to port, How will the center of buoyancy respond?
It will move to port
See REF839

A vessel is "listed" when it is _____.
inclined due to off-center weight

Your vessel is listing because of a negative GM. To lower G below M, you should _____.
add weight symmetrically below G

When the height of the metacenter is less than the height of the center of gravity, a vessel has which type of stability?
Unstable

The righting moment can be determined by multiplying the displacement by the _____.
righting arm (GZ)

A moment is obtained by multiplying a force by its _____.
lever arm

Initial stability refers to stability _____.
at small angles of inclination

Reducing free surfaces has the effect of lowering the _____.
virtual height of the center of gravity

Which is TRUE of a "stiff" vessel?
Its period of roll is short.

The forward draft of your ship is 27'-11" and the after draft is 29'-03". The draft amidships is 28'-05". Your vessel is _____.
hogged

Of the following, the most important consideration for a tank vessel is _____.
the stress on the hull

The draft of the SS AMERICAN MARINER cannot exceed 23'-06" in order to cross a bar. The present drafts are: FWD 22'-03", AFT 24'-00". Use the white pages of the Stability Data Reference Book to determine the minimum amount of sea water to ballast the forepeak to achieve this condition _____.
96 tons

Your vessel displaces 497 tons. The existing deck cargo has a center of gravity of 2.5 feet above the deck and weighs 24 tons. If you load 18 tons of ground tackle with an estimated center of gravity of 18 inches above the deck, what is the final height of the CG of the deck cargo?
2.07 feet

The SS AMERICAN MARINER has drafts of: FWD 16'-10", AFT 19'-04". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 73 tons of seawater.
FWD 17'-05.8", AFT 18'-10.9"

Your vessel's drafts are: FWD 15'-09", AFT 16'-08"; and the KG is 23.6 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the angle of list if the center of gravity is shifted 0.9 foot off the centerline.
15°

You are scheduled to load 3200 tons of cargo, 45 tons of crew effects and stores and 323 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in salt water.
16'-04"

Your vessel's drafts are: FWD 24'-06", AFT 25'-08"; and the KG is 22.9 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 50° inclination if the center of gravity is 0.5 foot off center.
2.3 feet

Your vessel's drafts are: FWD 22'-09", AFT 23'-07"; and the KG is 24.2 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 18° inclination.
0.7 foot

Your vessel's drafts are: FWD 22'-03", AFT 22'-09"; and the KG is 24.4 feet. What is the righting moment when the vessel is inclined to 15°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
5,916 foot-tons

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 24.2 feet, and the drafts are: FWD 22'-04", AFT 23'-00"; at what angle will the vessel lose positive stability?
78°

A vessel has a cargo hold divided by a shaft alley into two tanks, each 35 feet long and 20 feet wide. Each tank is half filled with sea water. The vessel displaces 5,000 tons. What is the reduction in GM due to free surface effect?
.27 foot

A shaft alley divides a vessel's cargo hold into two tanks, each 20 ft. wide by 60 ft. long. Each tank is filled with saltwater below the level of the shaft alley. The vessel's displacement is 7,000 tons. What is the reduction in GM due to free surface effect?
.33 feet

The liquid mud tanks on your vessel measure 24'L by 16'B by 8'D. The vessel's displacement in fresh water is 864 tons and the specific gravity of the mud is 1.47. What is the reduction in GM due to 2 of these tanks being slack?
.80 foot

Your sailing drafts are: FWD 24'-02", AFT 24'-10" and the GM is 4.6 feet. What will be the angle of list if #6 starboard double bottom (capacity 95 tons, VCG 2.6 feet, and 21 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
2°

You are on a Mariner class cargo vessel. Your drafts are: FWD 17'-04", AFT 19'-04". You wish to increase the calculated GM of 3.0' to 4.2'. What tanks should you ballast? (Use the white pages in the Stability Data Reference Book.)
Tanks: DB3, DB4

Your vessel measures 131 feet long by 20 feet in beam. If the natural rolling period at a draft of 8'-03" is 6 seconds, what is the GM?
2.15 feet
See REF637

Your vessel has a displacement of 10,000 tons. It is 350 feet long and has a beam of 55 feet. You have timed its rolling period to be 15.0 seconds. What is your vessel's approximate GM?
2.60 feet
See REF637

A vessel is limited to a maximum draft of 25'-11". The present drafts are: FWD 24'-10", AFT 23'-02". How much more cargo can be loaded and where should it be located if a drag of 18 inches is desired? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
690 tons 62 feet aft of the tipping center

Which statement about the free surface effect is TRUE?
It has the same affect on initial stability whether the tank is 75% full or 25% full.
See REF136

A tank 36 ft. by 36 ft. by 6 ft. is filled with water to a depth of 5 ft. If a bulkhead is placed in the center of the tank running fore-and-aft along the 36-foot axis, how will the value of the moment of inertia of the free surface be affected?
The moment of inertia would be 1/4 its original value.

A vessel with a large GM will _____.
be subject to severe racking stresses
See REF840

The center of buoyancy is located at the _____.
geometric center of the displaced volume
See REF133

In the absence of external forces, the center of buoyancy of an inclined vessel is vertically aligned directly below the _____.
center of gravity
See REF133

The principal danger from ice collecting on a vessel is the _____.
loss of stability
See REF845

A vessel is "listed" when it is _____.
inclined due to an off-center weight

A vessel has a strong wind on the port beam. This has the same effect on stability as _____.
weight that is off-center to starboard

When the height of the metacenter is the same as the height of the center of gravity, the upright equilibrium position is _____.
neutral

GM cannot be used as an indicator of stability at all angles of inclination because _____.
M is not fixed at large angles

The moment created by a force of 12,000 tons and a moment arm of 0.25 foot is _____.
3,000 ft-tons

Initial stability of a vessel may be improved by _____.
closing crossover valves between partly filled double bottom tanks
adding weight low in the vessel
removing loose water
All of the above.

Increasing free surfaces has the effect of raising the _____.
virtual height of the center of gravity

The KG of a vessel is found by dividing the displacement into the _____.
sum of the vertical moments of the vessel

A ship's forward draft is 22'-04" and its after draft is 23'-00". The draft amidships is 23'-04". This indicates a concentration of weight _____.
amidships

What is not usually a concern when loading a single-hulled tanker?
Initial stability

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 23.7 feet and the drafts are: FWD 28'-00", AFT 28'-06".
21°

Your drafts are: FWD 23'-03", AFT 27'-01". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in salt water.
13,150 tons

The SS AMERICAN MARINER has drafts of: FWD 19'-04", AFT 21'-02". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 68 tons of seawater.
FWD 19'-11.1", AFT 20'-09.4"

Your vessel's draft is 16'-00" fwd. and 18'-00" aft. The MT1 is 500 ft-tons. How many tons of water must be shifted from the after peak to the forepeak, a distance of 250 feet, to bring her to an even draft forward and aft?
48 tons
See REF614

You are scheduled to load 3700 tons of cargo, 45 tons of crew effects and stores and 427 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in fresh water.
17'-10"

Your vessel's drafts are: FWD 22'-04", AFT 23'-06"; and the KG is 22.4 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 19° inclination if the center of gravity is 1.3 feet off center.
0.2 foot

Your vessel's drafts are: FWD 22'-04", AFT 22'-10"; and the KG is 22.6 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 45° inclination.
3.6 feet

Your vessel's drafts are: FWD 24'-07", AFT 25'-09"; and the KG is 24.0 feet. What is the righting moment when the vessel is inclined to 15°? (Use the selected stability curves in Section 1, the blue pages, of the Stability Data Reference Book)
8,666 foot-tons

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 25.2 feet, and the drafts are: FWD 22'-03", AFT 23'-01"; at what angle will the vessel lose positive stability?
68°

Your vessel displaces 747 tons and measures 136'L by 34'B. You ship a large wave on the after deck. What is the reduction to GM due to free surface before the water drains overboard, if the after deck measures 56'L x 34'B and the weight of the water is 58.6 tons?
6.51 feet

On a vessel of 10,000 tons displacement, compute the reduction in metacentric height due to free surface in a hold having free water on tank tops. The hold is 50 feet long and 50 feet wide. What is the reduction in metacentric height?
1.5 feet
See REF621

The liquid mud tanks on your vessel measure 22'L by 16'B by 7'D. The vessel's displacement is 568 T and the specific gravity of the mud is 1.6. What is the reduction in GM due to 2 of these tanks being slack?
1.18 feet

A cargo of 75 tons is to be lifted with a boom located 50 feet from the ship's centerline. The ship's displacement including the suspended cargo is 6,000 tons and GM is 6 feet. The list of the ship with the cargo suspended from the boom will be _____.
5.94°

You are on a Mariner class cargo vessel. Your drafts are: FWD 26'-06", AFT 28'-02". You wish to increase the calculated GM of 2.7' to 2.9'. What tanks should you ballast? (Use the white pages in the Stability Data Reference Book.)
Tanks: DB1, DT1

Your vessel measures 126 feet (38.41 meters) long by 21 feet (6.4 meters) in beam. If the natural rolling period at a draft of 8 feet (2.44 meters) is 6 seconds, what is the GM?
2.4 feet (0.70 meters)
See REF637

Your vessel has a displacement of 24,500 tons. It is 529 feet long and has a beam of 71 feet. You have timed your vessel's rolling period to be 25.0 seconds. What is your vessel's approximate GM?
1.56 feet
See REF637

Your vessel's drafts are: FWD 23'-10", AFT 26'-00". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 18 inches? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
45 tons

Where are the draft marks required to be displayed on a ship?
Area of water line near stem and stern

Which statement about the free surface correction is TRUE?
The correction decreases as the draft increases due to loading dry cargo.
See REF136

When displacement increases, the free surface moments of slack tanks _____.
remain unchanged
See REF136

A vessel with a large GM will _____.
have more resistance to listing in case of damage
See REF840

In the presence of external forces, the center of buoyancy of an inclined vessel is vertically aligned with the _____.
metacenter
See REF133

Which of the following describes why topside icing, which is usually off-center, decreases vessel stability?
it increases the height of the center of gravity
See REF845

If a vessel lists to port, the center of buoyancy will _____.
move to port

When a vessel is inclined at a small angle the center of buoyancy will _____.
move toward the low side

When the height of the metacenter is greater than the height of the center of gravity a vessel has which type of stability?
Stable

The horizontal distance between the vertical lines of action of gravity and the buoyant forces is called the _____.
righting arm

A moment of 300 ft-tons is created by a force of 15,000 tons. What is the moment arm?
0.02 foot

GM cannot be used as an indicator of stability at all angles of inclination because _____.
M is not fixed at large angles

If the result of loading a vessel is an increase in the height of the center of gravity, there will always be an increase in the _____.
vertical moments

The result of two forces acting in opposite directions and along parallel lines, is an example of what type of stress?
Shear
See REF856

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 22.2 feet and the drafts are: FWD 23'-06", AFT 24'-03".
26°

Your drafts are: FWD 23'-03", AFT 24'-01". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in fresh water.
12,000 tons

The SS AMERICAN MARINER has drafts of: FWD 15'-06", AFT 18'-06". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 62 tons of seawater.
FWD 16'-00.7", AFT 18'-01.5"

Your vessel's drafts are FWD 20'-09", AFT 21'-01". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if: (1) 320 tons are loaded 47 feet forward of amidships; (2) 82 tons are discharged 110 feet forward of amidships; and (3) 50 tons of fuel are pumped 60 feet forward.
FWD 21'-06", AFT 21'-02"

You are scheduled to load 3700 tons of cargo, 45 tons of crew effects and stores and 427 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in salt water.
17'-05"

Your vessel displaces 9,000 tons and has a KG of 21.2 feet. What will be the length of the remaining righting arm at an angle of inclination of 30° if the center of gravity shifts 2.6 feet transversely? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
1.4 feet

Your vessel's drafts are: FWD 24'-06", AFT 25'-04"; and the KG is 22.2 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 20° inclination.
1.4 feet

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 22.0 feet, and the drafts are: FWD 23'-06", AFT 24'-03"; at what angle will the vessel lose positive stability?
98°

Your vessel displaces 840 tons and measures 146'L x 38'B. You ship a large wave on the after deck. What is the reduction in GM due to free surface before the water drains overboard, if the after deck measures 65'L x 38'B and the weight of the water is 76 tons?
9.27 feet

On a vessel of 12,000 tons displacement, what is the reduction in metacentric height due to free surface when a tank 60 feet long and 60 feet wide is partially filled with water?
2.57 feet
See REF621

The liquid mud tanks on your vessel measure 40'L by 20'B by 8'D. The vessel's displacement is 996 T and the specific gravity of the mud is 1.7. What is the reduction in GM due to 2 of these tanks being slack?
2.54 feet

Your vessel is preparing to lift a weight of 30 tons with a boom whose head is 30 feet from the ship's centerline. The ship's displacement not including the weight lifted is 8,790 tons. KM is 21.5 ft, KG is 20.5 ft. What would be the angle of list when the weight is lifted?
5.8°

You are on a Mariner class cargo vessel. Your drafts are: FWD 21'-04", AFT 23'-04". You wish to increase the calculated GM of 4.8' to 5.8'. What tanks should you ballast? (Use the white pages in the Stability Data Reference Book.)
Tanks: DB4, DB7

Your vessel measures 122 feet long by 18 feet in beam. If the natural rolling period at a draft of 6'-09" is 5 seconds, what is the GM?
2.5 feet
See REF637

You have approximately 6 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 7 feet? (total displacement is 422 tons)
0.1 foot
See REF639

Your vessel's drafts are: FWD 19'-03", AFT 21'-03". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 18 inches? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
31 tons

What is the center around which a vessel trims called?
the tipping center

Which statement about free surface is TRUE?
Pocketing occurs at small angles of inclination when a tank is 98% full.
See REF136

When displacement increases, the free surface corrections for slack tanks _____.
decrease
See REF136

A vessel with a large GM will _____.
provide a comfortable ride for the crew and passengers
See REF840

Topside icing that blocks freeing ports and scuppers _____.
may decrease stability by increasing free surface effect due to water on deck

See REF845

When a vessel is inclined by an external force, the _____.
vessel's center of buoyancy shifts to the center of the vessel's underwater hull

Movement of liquid in a tank when a vessel inclines causes an increase in _____.
natural rolling period

When the height of the metacenter is less than the height of the center of gravity, a vessel has which type of stability?
Negative

Metacentric height is a measure of _____.
initial stability only
See REF135

The magnitude of a moment is the product of the force and _____.
lever arm

On a vessel, multiplying a load's weight by the distance of the load's center of gravity above the baseline results in a(n) _____.
vertical moment

Why can the vessel's GM not be used as an indicator of stability at all angles of inclination?
M is not fixed at large angles

The important stability parameter "KG" is defined as the _____.
height of the center of gravity above the keel

The shearing stresses on a ship's structure are usually greatest at _____.
the ship's quarter-length points
See REF856

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 21.2 feet and the drafts are: FWD 27'-11", AFT 28'-07".
24°

Your drafts are: FWD 24'-09", AFT 27'-02". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in fresh water.
13,350 tons

Your drafts are: FWD 20'-08", AFT 25'-03". Use the blue pages of the Stability Data Reference Book to determine the MT1.
1070 foot-tons

Your vessel's drafts are FWD 20'-08", AFT 23'-00". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 95 tons of cargo are loaded 76 feet forward of amidships.
FWD 21'-01", AFT 22'-11"

You are scheduled to load 4700 tons of cargo, 45 tons of crew effects and stores and 323 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in salt water.
19'-00"

Your vessel displaces 12,000 tons and has a KG of 22.6 feet. What will be the length of the remaining righting arm at an angle of inclination of 30° if the center of gravity shifts 1.8 feet transversely? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
0.8 foot

Your vessel's drafts are: FWD 18'-06", AFT 19'-01"; and the KG is 18.2 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 35° inclination.
5.8 feet

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 23.0 feet, and the drafts are: FWD 15'-03", AFT 15'-09"; at what angle will the vessel lose positive stability?
90°

Your vessel displaces 562 tons and measures 121'L x 29'B. You ship a large wave on the after deck. What is the reduction to GM due to free surface before the water drains overboard, if the after deck measures 46'L x 29'B and the weight of the water is 41 tons?
4.43 feet
See REF623

On a vessel of 6,000 tons displacement there are two slack tanks of carbon tetrachloride (SG 1.6). Each tank is 40 feet long and 25 feet wide. What is the reduction in metacentric height due to free surface with the vessel in sea water (SG 1.025)?
.77 ft
See REF621

The liquid mud tanks on your vessel measure 32'L by 15'B by 8'D. The vessel's displacement is 640 tons and the specific gravity of the mud is 1.8. What is the reduction in GM due to 2 of these tanks being slack?
1.41 feet

Your sailing drafts are: FWD 18'-03", AFT 19'-07" and the GM is 4.3 feet. What will be the angle of list if #2 starboard double bottom (capacity 78 tons, VCG 2.7 feet, and 24.5 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
3°

You are on a Mariner class cargo vessel. Your drafts are: FWD 22'-06", AFT 25'-06". You wish to increase the calculated GM of 4.8' to 5.9'. What tanks should you ballast? (Use the white pages in the Stability Data Reference Book.)
Tanks: DB2, DB5

Your vessel measures 125 feet long by 17 feet in beam. If the natural rolling period at a draft of 7'-09" is 6 seconds, what is the GM?
1.55 feet
See REF637

You have approximately 15 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 8 feet? (total displacement is 300 tons)
0.4 foot
See REF639

Your vessel's drafts are: FWD 19'-03", AFT 21'-03". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 1 foot? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
62 tons

When the forward drafts and the after drafts are averaged, which of the following describes the result?
mean draft

Which factor has the greatest effect on the value of the free surface correction?
The width of the tank
See REF136

As the displacement of a vessel increases, the detrimental effect of free surface _____.
decreases

A vessel with a large GM will _____.
be subject to severe racking stresses
See REF840

Topside icing decreases vessel stability because it increases _____.
KG
See REF845

Your vessel has taken a slight list from off-center loading of material on deck. The _____.
list should be easily removed

Your vessel rolls slowly and sluggishly. This indicates that the vessel _____.
has poor stability

When the height of the metacenter is greater than the height of the center of gravity, the upright equilibrium position is stable and stability is _____.
positive

When a vessel is floating upright, the distance from the keel to the metacenter is called the _____.
height of the metacenter

When a vessel has positive stability, the distance between the line of force through B and the line of force through G is called the _____.
righting arm

The center of gravity of a freely swinging load suspended from a pedestal crane acts as if it were located at the _____.
counterweight
See REF133

The righting moment can be determined by multiplying the displacement by the _____.
righting arm (GZ)

A partially full tank causes a virtual rise in the height of the _____.
center of gravity

Which action will affect the trim of a vessel?
Moving a weight forward

Tensile stress is a result of two forces acting in _____.
opposite directions on the same line, tending to pull the material apart
See REF857

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 22.4 feet, and the drafts are: FWD 19'-06", AFT 20'-00".
24°

Your drafts are: FWD 24'-09", AFT 27'-02". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in salt water.
13,620 tons

Your drafts are: FWD 16'-02", AFT 20'-08". Use the blue pages of the Stability Data Reference Book to determine the MT1.
980 foot-tons

A vessel's drafts are FWD 23'-01", AFT 24'-11". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if: (1) 142 tons are discharged 122 feet forward of amidships; (2) 321 tons are loaded 82 feet forward of amidships; and (3) 74 tons are discharged 62 feet aft of amidships.
FWD 23'-09", AFT 24'-05"

You are scheduled to load 4700 tons of cargo, 45 tons of crew effects and stores and 323 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in fresh water.
19'-07"

Your vessel displaces 10,000 tons and has a KG of 22.6 feet. What will be the length of the remaining righting arm at an angle of inclination of 45° if the center of gravity shifts 2.0 feet transversely? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
2.7 feet

Your vessel's drafts are: FWD 17'-07", AFT 16'-09"; and the KG is 24.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 15° inclination.
0.7 foot

Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 24.2 feet, and the drafts are: FWD 23'-04", AFT 24'-05"; at what angle will the vessel lose positive stability?
75°

Your vessel displaces 368 tons and measures 96'L x 28'B. You ship a large wave on the after deck. What is the reduction to GM due to free surface before the water drains overboard, if the after deck measures 42'L x 28'B and the weight of the water is 36 tons?
5.43 feet

On a vessel of 5,000 tons displacement there are two slack tanks of acid (SG 1.8). Each tank is 30 feet long and 20 feet wide. What is the reduction in metacentric height due to free surface with the vessel in sea water (SG 1.025)?
.40 ft
See REF621

The liquid mud tanks on your vessel measure 20'L by 18'B by 7'D. The vessel's displacement is 986 T and the specific gravity of the mud is 1.6. What is the reduction in GM due to 2 of these tanks being slack?
.88 foot

Your sailing drafts are: FWD 19'-06", AFT 20'-10" and the GM is 3.3 feet. What will be the angle of list if the #2 starboard deep tank (capacity 100 tons, VCG 19.1 feet, and 24 feet off the centerline) is filled? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
4°

You are on a Mariner class cargo vessel. Your drafts are: FWD 24'-00", AFT 25'-08". You wish to increase the calculated GM of 3.0' to 4.1'. What tanks should you ballast? (Use the white pages in the Stability Data Reference Book.)
Tanks: DB4, DT6

Your vessel measures 128 feet long by 21 feet in beam. If the natural rolling period at a draft of 7'-06" is 6 seconds, what is the GM?
2.37 feet
See REF637

You have approximately 29 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 5 feet? (total displacement is 483 tons)
0.3 foot
See REF639

Your vessel's drafts are: FWD 14'-04", AFT 17'-08". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 18 inches? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
105 tons

How will the draft at the center of floatation change after transferring a weight forward on a vessel?
it will remain constant

What does NOT affect the value of the free surface correction?
Registered tonnage
See REF835

The free surface correction depends upon the dimensions of the surface of the free liquid and the _____.
displacement of the vessel

A vessel with a large GM will _____.
have a smaller amplitude of roll in heavy weather
See REF840

Buoyancy is a measure of the ship's _____.
ability to float
See REF133

At an angle of loll, the righting arm (GZ) is _____.
negative
See REF837

Your vessel has just finished bunkering and has a small list due to improper distribution of the fuel oil. This list will cause _____.
a decrease in reserve buoyancy
the vessel to flop to port and starboard
a decrease in the maximum draft
None of the above

The original equilibrium position is always unstable when _____.
metacentric height is negative

Metacentric height is an indication of a vessel's stability _____.
for small angles of inclination
See REF135

Subtracting KG from KM yields _____.
GM

For a given displacement, the righting arm has its maximum value when _____.
KG is minimum

Which will be a result of removing on-deck containers?
Metacentric height will increase

Which statement is TRUE of a tender vessel?
Its period of roll is long.
See REF853

Which technique could be used to give a more comfortable roll to a stiff vessel?
Concentrate weights on upper decks

The ship's tanks most effective for trimming are the _____.
peaks

A vessel's bottom will be subjected to tension when weight is concentrated _____.
amidships

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 21.8 feet and the drafts are: FWD 23'-05", AFT 24'-04".
26°

Your drafts are: FWD 23'-03", AFT 27'-01". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in fresh water.
12,900 tons

Your drafts are: FWD 16'-02", AFT 18'-02". Use the blue pages of the Stability Data Reference Book to determine the MT1.
960 foot-tons

A vessel's drafts are FWD 20'-08", AFT 20'-10". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 195 tons of cargo are discharged 76 feet forward of amidships.
FWD 19'-09", AFT 21'-01"

You are scheduled to load 3200 tons of cargo, 45 tons of crew effects and stores and 259 tons of fuel. Use the blue pages of the Stability Data Reference Book to determine the vessel's mean draft in fresh water:
16'-09"

A vessel displaces 12,000 tons and has a KG of 22.8 feet. What will be the length of the remaining righting arm at an angle of inclination of 60° if the center of gravity shifts 1.8 feet transversely? (Use the information in Section 1, the blue pages, of the Stability Data Reference Book)
1.9 feet

Your vessel's drafts are: FWD 18'-09", AFT 20'-05"; and the KG is 23.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 30° inclination.
2.1 feet

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability, and holds 1 and 2 flood, the vessel will sink if the permeability exceeds what percent?
32 (%)

Determine the free surface constant for a fuel oil tank 30 ft. long by 40 ft. wide by 15 ft. deep. The specific gravity of the fuel oil is .85 and the ship is floating in saltwater (S.G. 1.026).
3787

See REF620

Your vessel displaces 477 tons and measures 116'L x 31'B. You ship a large wave on the after deck. What is the reduction in GM due to free surface before the water drains overboard, if the after deck measures 54'L x 31'B and the weight of the water is 51.5 tons?
7.25 feet
See REF624

On a vessel of 9,000 tons displacement there are two slack deep tanks of palm oil (SG .86). Each tank is 40 feet long and 30 feet wide. What is the reduction in metacentric height due to free surface with the vessel in sea water (SG 1.025)?
.48 ft
See REF621

The liquid mud tanks on your vessel measure 24'L by 16'B by 8'D. The vessel's displacement in salt water (specific gravity 1.025) is 864 T and the specific gravity of the mud is 1.47. What is the reduction in GM due to 2 of these tanks being slack?
0.78 foot

Your sailing drafts are: FWD 21'-08", AFT 22'-04" and the GM is 3.2 feet. What will be the angle of list if the #6 port deep tank (capacity 201 tons, VCG 11.4 feet, and 25.5 feet off the centerline) is filled? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
8°

Your vessel measures 119 feet long by 17 feet in beam. If the natural rolling period at a draft of 5'-05" is 6 seconds, what is the GM?
1.55 feet
See REF637

You have approximately 60 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 8 feet? (total displacement is 960 tons)
0.5 foot
See REF639

Your vessel's draft is 24'-06" forward and aft. The MT1 of your vessel is 1000 ft-tons. How many tons of cargo must be loaded in number 4 hold, which is 100 feet abaft the tipping center, if she is to have a 2 foot drag?
240 tons

What is the maximum mean draft to which a vessel may be safely loaded called?
load line draft

The most important figure in calculating the free surface constant of a tank carrying liquids is _____.
breadth

The free surface effects of a partially full liquid tank decrease with increased _____.
displacement volume of the vessel

Addition of weight above the center of gravity of a vessel will ALWAYS _____.
reduce initial stability
See REF302

At an angle of loll, the righting moment is _____.
negative
See REF837

If your vessel has a list to port due to negative GM and off-center weight, the first corrective measure you should take is to _____.
fill the starboard double-bottom

What is the stability term for the distance from the center of gravity (G) to the Metacenter (M), when small-angle stability applies?
metacentric height

The important initial stability parameter, GM, is the _____.
metacentric height

When a wind force causes a vessel to heel to a static angle, the _____.
righting moment equals the wind-heeling moment

When cargo is shifted from the lower hold to the main deck the _____.
center of gravity will move upwards

What is used as an indicator of initial stability?
GM

What will NOT decrease the stability of a vessel?
Lowering a weight suspended by a boom onto the deck

Those ship's tanks that are particularly important for trimming the ship are the _____.
peaks

Weight concentration in which area will cause a vessel's bottom to be subjected to tension stresses?
Amidships

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 21.8 feet and the drafts are: FWD 19'-05", AFT 20'-01".
26°

What is the displacement of a barge which measures 85' x 46' x 13' and is floating in salt water with a draft of ten feet?
1117 tons
See REF613

Your drafts are: FWD 23'-03", AFT 27'-01". Use the blue pages of the Stability Data Reference Book to determine the MT1.
1130 foot-tons

Your vessel's drafts are FWD 19'-03", AFT 21'-07". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 142 tons of fuel are pumped 86 feet aft.
FWD 18'-09", AFT 22'-01"

Your vessel's drafts are: FWD 16'-08", AFT 17'-06"; and the KG is 23.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 60° inclination if the center of gravity is 1.7 feet off the centerline.
2.1 feet

Your vessel's drafts are: FWD 27'-06", AFT 28'-02"; and the KG is 23.1 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 60° inclination.
1.8 feet

Your vessel's drafts are: FWD 18'-09", AFT 20'-05"; and the KG is 23.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 15° inclination.
0.7 foot

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability, and holds 2 and 3 flood, the vessel will sink if the permeability exceeds what percent?
37 (%)

On a vessel of 34,000 tons displacement, a tank 80 ft. long, 60 ft. wide and 30 ft. deep is half filled with fresh water (SG 1.000) while the vessel is floating in saltwater (SG 1.026). What is the free surface constant for this tank?
40100
See REF621

Your vessel displaces 968 tons and measures 158'L x 40'B. You ship a large wave on the after deck. What is the reduction to GM due to free surface before the water drains overboard, if the after deck measures 65'L x 40'B and the weight of the water is 80 tons?
9.45 feet
See REF625

On a vessel displacing 8,000 tons, what is the reduction in metacentric height due to free surface when a tank 45 feet long and 45 feet wide is partly filled with salt water?
1.22 feet
See REF630

The liquid mud tanks on your vessel measure 30'L by 15'B by 6'D. The vessel's displacement is 968 T and the specific gravity of the mud is 1.8. What is the reduction in GM due to 2 of these tanks being slack?
.87 foot

A cargo of 50 tons is to be loaded on deck 20 feet from the ship's centerline. The vessel's displacement including the 50 ton cargo will be 3,000 tons and the GM three feet. What would be the list of the vessel after loading the cargo?
6.35°

The period of roll is the time difference between _____.
full inclination on one side to the next full inclination on the same side

You have approximately 16 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 8 feet? (total displacement is 640 tons)
0.2 foot
See REF639

Your vessel is on an even keel. The MT1 of your vessel is 1000 ft-tons. How many tons of cargo must be loaded in number 4 hold which is 100 feet abaft the tipping center, if she is to have a 2 foot drag?
240 tons

What is the difference between the initial trim and the trim after loading known as?
change of trim

The effects of free surface on a vessel's initial stability do NOT depend upon the _____.
amount of liquid in slack tanks

The effects of free surface on initial stability depend upon the dimensions of the surface of the free liquids and the _____.
volume of displacement of the vessel

A vessel's KG is determined by _____.
dividing the total vertical moment summation by displacement
See REF841

At all angles of inclination, the true measure of a vessel's stability is the _____.
righting moment
See REF846

The difference between the starboard and port drafts caused by shifting a weight transversely is _____.
list
See REF851

An unstable upright equilibrium position on a vessel means that the metacenter is _____.
lower than the center of gravity

Which formula can be used to calculate metacentric height?
KM - KG

Subtracting GM from KM yields _____.
KG

For a vessel inclined by the wind, multiplying the buoyant force by the horizontal distance between the lines of action of the buoyant and gravity forces gives the _____.
righting moment

What will happen when cargo is shifted from the main deck into the lower hold of a vessel?
The GM will increase.

Initial stability is indicated by _____.
GM

A virtual rise in the center of gravity may be caused by _____.
using an on board crane to lift a freely swinging heavy object
See REF854

The change in trim of a vessel may be found by _____.
dividing the trim moments by MT1

Signs of racking stresses generally appear at the _____.
junction of the frames with the beams and floors
See REF858

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 22.4 feet and the drafts are: FWD 15'-03", AFT 15'-09".
25°

The SS AMERICAN MARINER has drafts of: FWD 26'-04", AFT 28'-08". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 101 tons of seawater.
FWD 27'-01.2", AFT 28'-02.5"

Your drafts are: FWD 20'-08", AFT 23'-03". Use the blue pages of the Stability Data Reference Book to determine the MT1.
1050 foot-tons

A vessel's drafts are FWD 19'-02", AFT 23'-10". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 98 tons of fuel is pumped 116 feet forward.
FWD 19'-07", AFT 23'-04"

Your vessel's drafts are: FWD 27'-06", AFT 28'-02"; and the KG is 23.1 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 60° inclination if the center of gravity is 2.4 feet off the centerline.
0.5 foot

The sailing drafts are: FWD 25'-03", AFT 26'-03" and the GM is 3.5 feet. Use the information in Section 1, the blue pages, of the Stability Data Reference Book, to determine the available righting arm at 25° inclination.
2.0 feet

Your vessel's drafts are: FWD 17'-07", AFT 16'-09"; and the KG is 21.5 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 30° inclination.
3.6 feet

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability and holds 4 and 5 flood, the vessel will sink if the permeability exceeds what percent?
28 (%)

On a vessel of 6500 tons displacement, a tank 30 ft. long, 32 ft. wide and 15 ft. deep is half filled with oil cargo (S.G. 0.948) while the vessel is floating in saltwater (S.G. 1.026). What is the free surface constant for this tank?
2162
See REF621

Your vessel displaces 869 tons and measures 136'L x33'B. You ship a large wave on the after deck which measures 52'Lx 33'B. The weight of the water is estimated at 52.8 tons. What is the reduction in GM due to free surface before the water drains overboard?
4.83 feet
See REF626

On a vessel of 8,000 tons displacement, compute the reduction in metacentric height due to free surface in a hold having free water in the tank tops. The hold is 40 feet long and 20 feet wide. What is the reduction in metacentric height?
0.1 ft
See REF621

The liquid mud tanks on your vessel measure 18'L by 10'B by 6'D. The vessel's displacement is 944 T and the specific gravity of the mud is 1.9. What is the reduction in GM due to 2 of the tanks being slack?
.16 foot

Your sailing drafts are: FWD 14'-04", AFT 16'-02" and the GM is 3.0 feet. What will be the angle of list if #5 port double bottom (capacity 195 tons, VCG 2.6 feet, and 18.5 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
8°

When the wave period and the apparent rolling period are the same _____.
synchronous rolling occurs
See REF638

You have approximately 24 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 8 feet? (total displacement is 540 tons)
0.36 foot
See REF639

Your vessel's drafts are: FWD 14'-04", AFT 17'-08". The LCG of the forepeak is 200 feet forward of amidships. How many tons of ballast must be pumped into the forepeak in order to have a drag of 2 feet? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
75 tons

For an upright vessel, draft is the vertical distance between the keel and the _____.
waterline

The effect of free surface on initial stability depends upon _____.
the dimensions of the liquid surface and the vessel's displacement

Which statement about the free surface correction is TRUE?
It is obtained by dividing the free surface moments by 12 times the volume of displacement.
See REF136

A floating vessel will behave as if all of its weight is acting downward through the _____.
center of gravity
See REF133

A vessel would be referred to as "tender" when the weight of the cargo is _____.
concentrated high and the double bottoms are empty
See REF847

During cargo operations, your vessel develops a list due to the center of gravity rising above the transverse metacenter. To correct the list, you should _____.
add weight in the lower holds or double bottoms

When the height of the metacenter is less than the height of the center of gravity of a vessel, the upright equilibrium position is _____.
unstable

The difference between the height of the metacenter and the metacentric height is known as _____.
height of the center of gravity

For a floating vessel, the result of subtracting KG from KM is the _____.
metacentric height

When positive stability exists, GZ represents the _____.
righting arm

You must shift a weight from the upper 'tween deck to the lower hold. This shift will _____.
make the vessel stiffer

Vertical moment is obtained by multiplying a vessel's weight and its _____.
VCG or KG

One of the main purposes of the inclining experiment on a vessel is to determine the _____.
location of the center of gravity of the light ship

Which would NOT provide extra buoyancy for a vessel with no sheer?
Higher bulwark

When a vessel is stationary and in a hogging condition, the main deck is under which type of stress?
tension

The time required to incline from port to starboard and back to port again is called _____.
rolling period

Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 25.0 feet and the drafts are: FWD 15'-04", AFT 15'-08".
23°

The SS AMERICAN MARINER has drafts of: FWD 28'-00", AFT 29'-00". Use the white pages of the Stability Data Reference Book to determine the drafts if you ballast the forepeak with 81.05 tons of seawater.
FWD 28'-07.3", AFT 28'-07.8"

A weight of 250 tons is loaded on your vessel 95 feet forward of the tipping center. The vessel's MT1 is 1000 ft-tons. What is the total change of trim?
23.75 inches

Your vessel's drafts are FWD 20'-08", AFT 23'-00". Use the information in Section 1, the blue pages, of the Stability Data Reference Book to determine the final drafts if 195 tons of cargo are discharged 76 feet aft of amidships.
FWD 20'-11", AFT 22'-00"

Your vessel's drafts are: FWD 27'-06", AFT 28'-02"; and the KG is 23.1 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 37° inclination if the center of gravity is 1.8 feet off center.
0.4 foot

The sailing drafts are: FWD 22'-06", AFT 23'-06" and the GM is 3.3 feet. Use the information in Section 1, the blue pages, of the Stability Data Reference Book, to determine the available righting arm at 22° inclination.
1.8 feet

Your vessel's drafts are: FWD 22'-04", AFT 22'-10"; and the KG is 18.4 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the righting arm at 30° inclination.
4.6 feet

Use the floodable length curve in Section 1, the blue pages, of the Stability Data Reference Book. If the curve represents 45 percent permeability and number 5 hold floods, the vessel will sink if the permeability exceeds what percent?
66 (%)

On a vessel of 7000 tons displacement, a tank 35 ft. long, 30 ft. wide and 46 ft. deep is half filled with liquid cargo (S.G. 0.923) while the vessel is floating in saltwater (S.G. 1.026). What is the free surface constant for this tank?
2024
See REF621

Your vessel displaces 689 tons and measures 123'L x 31'B. You ship a large wave on the after deck which measures 65'Lx 31'B. The weight of the water is estimated at 62 tons. What is the reduction in GM due to free surface before the water drains overboard?
6.14 feet
See REF627

Your vessel displaces 696 tons and measures 135'L by 34'B. What is the reduction in GM due to free surface if the fish hold (32'L by 29'B by 9'D) is filled with 2.0 feet of water? (Each foot of water weighs 26.5 tons)
2.48 feet

The liquid mud tanks on your vessel measure 20'L by 18'B by 7'D. The vessel's displacement is 866 T and the specific gravity of the mud is 1.8. What is the reduction in GM due to 2 of these tanks being slack?
1.12 feet

A cargo of 100 tons is to be loaded on deck 20 feet from the ship's centerline. The ship's displacement including the 100 tons of cargo will be 10,000 tons and the GM two feet. What would be the list of the vessel after loading the cargo?
5.7°

You are on a vessel that has a metacentric height of 4 feet, and a beam of 50 feet. What can you expect the rolling period of the vessel to be?
11.0 seconds

You have approximately 34 tons of fish on deck. What will be the shift in the center of gravity after you shift the fish to the fish hold, a vertical distance of 7.5 feet? (total displacement is 638 tons)
0.4 foot
See REF639

You are hoisting a heavy lift with the jumbo boom. Your vessel displaces 8560 T. The 45-ton weight is on the pier and its center is 65' to starboard of the centerline. The head of the boom is 95' above the base line and the center of gravity of the lift when stowed on deck will be 55' above the base line. As the jumbo boom takes the strain the ship lists to 5.5°. What is the GM with the cargo stowed?
3.74 ft.

Forces within a vessel may cause a difference between the starboard and port drafts. What is this difference called?
list

A tank which carries liquid is dangerous to the stability of a vessel when it is _____.
slack

The free surface effects of a partially full tank in a vessel increase with the _____.
surface area of the fluid in the tank

The water in which a vessel floats provides vertical upward support. The point through which this support is assumed to act is known as the center of _____.
buoyancy
See REF133

The center of flotation of a vessel is the geometric center of the _____.
waterplane area
See REF133

Aboard a vessel, multiplying a load's weight by the distance of the load's center of gravity from the centerline results in the load's _____.
transverse moment
See REF848

Assuming an even transverse distribution of weight in a vessel, which condition could cause a list?
Empty double-bottoms and lower holds, and a heavy deck cargo

When the height of the metacenter is the same as the height of the center of gravity of a vessel, the upright equilibrium position is _____.
neutral

The abbreviation GM is used to represent the _____.
metacentric height

If the metacentric height is small, a vessel will _____.
be tender

The angle of maximum righting arm corresponds approximately to the angle of _____.
deck edge immersion

Deballasting a double bottom has what effect on KG?
KG is increased.

A vertical shift of weight to a position above the vessel's center of gravity will _____.
decrease the righting moments

The purpose of the inclining experiment is to _____.
determine the lightweight center of gravity location

The "trimming arm" of a vessel is the horizontal distance between the _____.
LCB and LCG

When a vessel is stationary and in a hogging condition, the main deck is under _____.
tension stress

The time required to incline from bow down to stern down and return to bow down again is called _____.
pitching period

REF037
A ship at sea moves in six degrees of motion: heave, sway, surge, roll, pitch and yaw. The first three are linear motions. Heaving is the linear motion along the vertical Z-axis, swaying is the motion along the transverse Y-axis, and surging is the motion along the longitudinal X-axis. Rolling is a rotation around a longitudinal axis, pitching is a rotation around the transverse axis and yawing is a rotation around the vertical axis. HEAVE: The alternate rising and falling of a vessel in a seaway. SWAY: A vessel's motion from side to side. SURGE: A vessel's transient motion along her fore and aft axis. ROLL : Motion of the ship from side to side, alternately raising and lowering each side of the deck. The oscillating motion of a vessel from side to side due to ground swell, heavy sea, or other causes. PITCHING: The alternate rising and falling motion of a vessel's bow in a nearly vertical plane as she meets the crests and troughs of the waves. YAWING: To turn from side to side on an uneven course.

REF131
Longitudinal Center of Gravity (abbreviated LCG) is a term that may be applied to your vessel as a whole or to any individual tank or compartment within your vessel. When applied to the vessel as a whole, LCG refers to the longitudinal position of the center of gravity or the location of the vessel's center of gravity in relation to the bow and stern. When applied to a tank or compartment, LCG refers to the longitudinal distance of a point within that tank or compartment from the vessel's tipping center.

REF133
Metacenter: The highest point to which G may rise and still permit the vessel to have positive stability. Found at the intersection of the line of action of B when the ship is erect with the line of action of B when the ship is given a small inclination. Center of Gravity: That point at which all the vertically downward forces of weight are considered to be concentrated; the center of the mass of the vessel.

REF135
The metacentric height (GM) is a measurement of the initial static stability of a floating body. It is calculated as the distance between the centre of gravity of a ship and its metacentre. A larger metacentric height implies greater initial stability against overturning.

REF136
Note: Any time a vessel pitches or rolls, the vessel's stability is adversely affected by any virtual rise in the center of gravity. This is caused by movement of liquid contents within partially flled tanks. The virtual rise in the center of gravity is a function of what is known as the free surface effect. Free surface is the surface area of liquid in tanks not in contact with tank boundaries as a vessel pitches or rolls. Transverse stability may be adversely affected by rolling action and longitudinal stability by pitching action due to the free surface effect. It refers to the tendency of liquids — and of unbound aggregates of small solid objects, like seeds, gravel, or crushed ore, whose behavior approximates that of liquids — to move in response to changes in the attitude of a craft's cargo holds, decks, or liquid tanks in reaction to operator-induced motions (or sea states caused by waves and wind acting upon the craft). When referring to the free surface effect, the condition of a tank that is not full is described as a "slack tank", while a full tank is "pressed up". In a normally loaded vessel any rolling from perpendicular is countered by a righting moment generated from the increased volume of water displaced by the hull on the lowered side. This assumes the center of gravity of the vessel is relatively constant. If a moving mass inside the vessel moves in the direction of the roll, this counters the righting effect by moving the center of gravity towards the lowered side. The free surface effect can become a problem in a craft with large partially full bulk cargo compartments, fuel tanks, or water tanks (especially if they span the full breadth of the ship), or from accidental flooding, such as has occurred in several accidents involving roll-on/roll-off ferries. If a compartment or tank is either empty or full, there is no change in the craft's center of mass as it rolls from side to side (in strong winds, heavy seas, or on sharp motions or turns). However, if the compartment is only partially full, the liquid in the compartment will respond to the vessel's heave, pitch, roll, surge, sway or yaw. For example, as a vessel rolls to port, liquid will displace to the port side of a compartment, and this will move the vessel's center of mass to port. This has the effect of slowing the vessel's return to vertical. The momentum of large volumes of moving liquids cause significant dynamic forces, which act against the righting effect. When the vessel returns to vertical the roll continues and the effect is repeated on the opposite side. In heavy seas, this can become a positive feedback loop, causing each roll to become more and more extreme, eventually overcoming the righting effect leading to a capsize. While repeated oscillations of increasing magnitude are commonly associated with the free surface effect, they are not a necessary condition. For example, in the cases of both the SS Normandie and MS al-Salam Boccaccio 98, gradual buildup of water from fire-fighting caused capsizing in a single continuous roll.

REF302

Initial Stability: Stability of a vessel for small angles of inclination (up to 15 degrees). Reserve Buoyancy: The volume of all intact space above the waterline.

REF610
To determine the total CG of a load, divide the total moment of the load by the total weight of the load. Step 1: Set up a table to categorize the known information.

Category	Weight	Height of CG	Moment
Existing Cargo	16 Tons	3 Feet	
Anchor and Chain	23 Tons	9 inches = .75'	
Total			

Step 2: Determine the individual moments of the loads.

Category	Weight	Height of CG	Moment
Existing Cargo	16 Tons	3 Feet	16 x 3 = 48
Anchor and Chain	23 Tons	9 inches = .75'	23 x .75 = 17.25
Total			

Step 3: Determine the total weights and total moments of the loads.

Category	Weight	Height of CG	Moment
Existing Cargo	16 Tons	3 Feet	16 x 3 = 48
Anchor and Chain	23 Tons	9 inches = .75'	23 x .75 = 17.25
Total	39 Tons		65.25

Step 4: Divide the total moment by the total weight to determine the total height of the CG. 65.25 ÷ 39 = 1.673 feet.

REF611
Your vessel displaces 368 tons and measures 96'L x 28'B. You ship a large wave on the after deck. What is the reduction to GM due to free surface before the water drains overboard, if the after deck measures 42'L x 28'B and the weight of the water is 36 tons? On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 42 x 28^3 / 420 x (368 + 36) or 42 x 21952 = 921984 / 169680 = 5.4336

REF612
Correct answer. “In order to fnd the change in position of center of gravity, the ofcer must employ the Theory of Moments … each known weight, including the light ship weight, must be multiplied by the appropriate height of the weight’s center of gravity(g), above the keel. Then, divide the sum of all these products (moments) by the total weights, including the weight of the light ship…” So, as per this formula, (41 tons × 1.5 feet) + (22 tons × 2.5 feet) /(41 tons + 22 tons) = 116.5 foot-tons /63 tons.

REF613
Displacement=(Length × Breadth × Draft)÷35 Displacement=(85×46×10)÷35 Displacement=1117.1 tons

REF614
Your vessel's draft is 16'-00" fwd. and 18'-00" aft. The MT1 is 500 ft-tons. How many tons of water must be shifted from the after peak to the forepeak, a distance of 250 feet, to bring her to an even draft forward and aft? Reference: Merchant Marine Officers Handbook Trimming Moments= (weight)(distance) Change in Trim= (Trimming Moments)/MTI Change in Trim= ((weight)(distance))/MTI 24”= ((weight)(250’))/500 ft-tons 12000=(weight)(250’) Weight= 48 tons

REF615
The displacement or displacement tonnage of a ship is its weight based on the amount of water its hull displaces at varying loads. It is measured indirectly using Archimedes' principle by first calculating the volume of water displaced by the ship then converting that value into weight displaced. Traditionally, various measurement rules have been in use, giving various measures in long tons. Today, metric tonnes are more used. Ship displacement varies by a vessel's degree of load, from its empty weight as designed (known as "Lightweight tonnage" to its maximum load. Numerous specific terms are used to describe varying levels of load and trim, detailed below. Ship displacement should not be confused with measurements of volume or capacity typically used for commercial vessels, such as net tonnage, gross tonnage, or

deadweight tonnage.

REF616
A tanker loads at a terminal within the tropical zone. She will enter the summer zone six days after departing the loading port. She will burn off 45 tons/day and daily water consumption is 8 tons. How many tons may she load over that allowed by her summer load line? Reference: LaDage; Modern Ships “the reduction in draft expected due to consumption of fuel, etc. on the way to the sea permits an increase in draft over the applicable mark to the amount of this reduction.” Allowable tonnage increase = (Fuel burn off + Water consumed) Days Allowable tonnage increase = (45+8) 6 Allowable tonnage increase = 318 tons

REF617
A tanker loads at a terminal within the tropical zone. She will enter the summer zone five days after departing the loading port. She will burn off about 45 tons/day and daily water consumption is 8 tons. How many tons may she load over that allowed by her summer load line? Reference: LaDage; Modern Ships “the reduction in draft expected due to consumption of fuel, etc. on the way to the sea permits an increase in draft over the applicable mark to the amount of this reduction.” Allowable tonnage increase = (Fuel burn off + Water consumed) Days Allowable tonnage increase = (45+8) 5 Allowable tonnage increase = 265 tons

REF618
A vessel's tropical load line is 6 in. above her summer load line. Her TPI is 127 tons. She will arrive in the summer zone 8 days after departure. She will burn off about 47 tons/day fuel and water consumption is 12 tons/day. How many tons may she load above her summer load line if she loads in the tropical zone? Reference: LaDage; Modern Ships “the reduction in draft expected due to consumption of fuel, etc. on the way to the sea permits an increase in draft over the applicable mark to the amount of this reduction.” Allowable tonnage increase = (Fuel burn off + Water consumed) Days Allowable tonnage increase = (47+12) 8 Allowable tonnage increase = 472 tons

REF619
Master, M/V SURVEYOR, O.N. 678678 D037DG 13 May 87 Subj: M/V SURVEYOR Stability Dear Sir: A stability test, supervised by the U.S. Coast Guard, was conducted on the M/V SURVEYOR at New Orleans, Louisiana, on 7 May 1987. On the basis of this test, stability calculations have been performed. Results indicate that the stability of the M/V SURVEYOR, as presently outfitted and equipped, is satisfactory for operation in Ocean Service as indicated on the Certificate of Inspection, provided the following restrictions are strictly observed: 1. A maximum of 78 persons may be carried. In no case shall the number of persons exceed that allowed on the Certificate of Inspection. 2. The drafts as read on the draft marks shall not exceed 6 feet 3 inches forward or 7 feet 1 inch aft. Trim should be minimized. A loadline is not authorized. 3. The height above the main deck of the center of gravity of deck cargo shall not exceed 2.0 feet. Such cargo must be positively secured before leaving protected waters. 4. A maximum of 50 long tons of deck cargo may be carried when no other below deck ballast or cargo is carried. When rig water is carried, a maximum of 35 long tons of deck cargo may be carried, and no other below deck cargo or ballast is permitted. 5. No permanent ballast or other such weights shall be added, removed, altered, and/or relocated without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection. 6. No watertight bulkheads shall be removed or altered without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection. 7. The watertight door in the bulkhead at frame 18 shall be closed and properly dogged at all times when underway except when actually used for transit under safe conditions. 8. Cross-connections between all tank sets shall be kept closed at all times when underway. 9. Bilges shall be kept pumped to minimum content at all times. 10. Jet fuel may be carried on deck in eight DOT tanks. The total weight of the fuel and tanks shall not exceed 23.16 long tons and the vertical center of gravity shall not exceed 3 feet 6 inches above the deck. Such tanks must be positively secured against shifting in a seaway prior to leaving protected waters. Neither passengers nor other deck cargo shall be carried when such tanks are aboard the vessel. 11. The Master should make every effort to determine the cause of any list of the vessel before taking corrective action. It shall be the Master's responsibility to maintain the vessel in a satisfactory stability condition at all times. This temporary stability letter shall be posted under suitable transparent material in the pilothouse of the vessel so that all pages are visible. It supersedes any stability information previously furnished the vessel. . Sincerely, . W. T. DOOR . Lieutenant Commander . U.S. Coast Guard

REF620
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: Free Surface Constant = # of Tanks * r * l * b^3 / 450 or (.85 / 1.026) x 30 x 40^3 / 420 or .82846 x 30 x 64000 = 16109266 / 420 = 3787.2457

REF621
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: # of Tanks x r x l x b^3 / 420 x Displacement or 50 x 50^3 / 420 x 10000 or 50 x 125000 = 6250000 / 4200000 = 1.488

REF622
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: # of Tanks x r x l x b^3 / 420 x Displacement or 2 x 60 x 15^3 / 420 x 10000 or 2 x 60 x 3375 = 405000 / 4200000 = 0.09642

REF623
Your vessel displaces 562 tons and measures 121'L x 29'B. You ship a large wave on the after deck. What is the reduction to GM due to free surface before the water drains overboard, if the after deck measures 46'L x 29'B and the weight of the water is 41 tons? On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 46 x 29^3 / 420 x (562 + 41) or 46 x 24386 = 1121894 / 253260 = 4.4298

REF624
Your vessel displaces 477 tons and measures 116'L x 31'B. You ship a large wave on the after deck. What is the reduction in GM due to free surface before the water drains overboard, if the after deck measures 54'L x 31'B and the weight of the water is 51.5 tons? On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 54 x 31^3 / 420 x (477 + 51.5) or 54 x 29791 = 1608714 / 221970 = 7.2474

REF625
Your vessel displaces 968 tons and measures 158'L x 40'B. You ship a large wave on the after deck. What is the reduction to GM due to free surface before the water drains overboard, if the after deck measures 65'L x 40'B and the weight of the water is 80 tons? On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 64 x 40^3 / 420 x (968 + 80) or 65 x 64000 = 4160000 / 440160 = 9.4511

REF626
Your vessel displaces 869 tons and measures 136'L x33'B. You ship a large wave on the after deck which measures 52'Lx 33'B. The weight of the water is estimated at 52.8 tons. What is the reduction in GM due to free surface before the water drains overboard? On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 52 x 33^3 / 420 x (869 + 52.8) or 52 x 35937 = 1868724 / 387156 = 4.8267

REF627
Your vessel displaces 689 tons and measures 123'L x 31'B. You ship a large wave on the after deck which measures 65'Lx 31'B. The weight of the water is estimated at 62 tons. What is the reduction in GM due to free surface before the water drains overboard? On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 65 x 31^3 / 420 x (689 + 62) or 65 x 29791 = 1936415 / 315420 = 6.1391

REF628
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: # of Tanks x r x l x b^3 / 420 x Displacement or 2 x (0.8 / 1.026) x 50 x 30^3 / 420 x 7000 or 2 x 0.7797 x 50 x 27000 = 2105190 / 2940000 = 0.7160

REF629
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: # of Tanks x r x l x b^3 / 420 x Displacement or 60 x 60^3 / 420 x 10000 or 60 x 216000 = 12960000 / 4200000 = 3.0857

REF630
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank The formula is: # of Tanks x r x l x b^3 / 420 x Displacement or 45 x 45^3 / 420 x 8000 or 45 x 91125 = 6250000 / 3360000 = 1.2204

REF631
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank Weight per Foot of Water x Feet of Water = Total Weight of Water = 3 x 22.3 = 66.9 The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 30 x 26^3 / 420 x (645 + 66.9) or 30 x 17576 = 527280 / 298998 = 1.7634

REF632
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank Weight per Foot of Water x Feet of Water = Total Weight of Water = 1.5 x 36.8 = 55.2 The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 46 x 28^3 / 420 x (930 + 55.2) or 46 x 21952 = 1009792 / 413784 = 2.4403

REF633
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank Weight per Foot of Water x Feet of Water = Total Weight of Water 2.8 x 15.4 = 43.12 The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 30 x 18^3 / 420 x (585 + 43.12) or 30 x 5832 = 174960 / 263810.4 = 0.6632

REF634
On average, seawater in the world's oceans has a salinity of about 3.5% (35 g/L, or 599 mM), which is a specific gravity of about 1.025. Specific Gravity (SG) = Density of substance / Density of water Free Surface Correction = Rise in G or reduction of GM r = Specific Gravity of liquid in tank / Specific Gravity of water in which the vessel is floating l = length of tank b = Breadth of tank Weight per Foot of Water x Feet of Water = Total Weight of Water = 2 x 26.5 = 53 The formula is: r x l x b^3 / 420 x (Displacement + Weight) or 32 x 29^3 / 420 x (684 + 53) or 32 x 24389 = 780448 / 309540 = 2.5213

REF635
Master, M/V HUDSON, O.N. 666666 8 Apr 87 Subj: M/V HUDSON Stability Dear Sir: A stability test, supervised by the U.S. Coast Guard, was conducted on the M/V HUDSON at San Diego, California on 08 April 1987. On the basis of this test, stability calculations have been performed. Results indicate that the stability of the M/V HUDSON, as presently outfitted and equipped, is satisfactory for operation in Ocean Service as indicated on the Certificate of Inspection, provided the following restrictions are strictly observed: 1. a. The vessel shall only be loaded according to the instructions on the attached LOADING DIAGRAM bearing U.S. Coast Guard approval stamp dated 8 April 1986. b. Drilling fluids may be carried. The maximum specific gravity of the fluids shall not exceed 2.60. c. The vessel may engage in towing operations

when loaded in accordance with the attached LOADING DIAGRAM. 2. The height above the main deck of the center of gravity of the deck cargo shall not exceed the value shown on the LOADING DIAGRAM (3.0 feet). Such cargo must be positively secured against shifting prior to leaving protected waters. 3. Permanent ballast, in the form of 64.4 long tons of high density fluids (sg. • 2.87), is to be maintained in the after peak tank. No permanent ballast shall be added, removed, altered and/or relocated without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection. 4. The maximum summer load line draft is 13 feet 8 3/8 inches. Trim shall be minimized and shall always result in a freeboard of at least 22 inches at the stern. 5. No more than one centerline or PIS pair of the following tanks may be partially filled at anyone time: fuel oil, lube oil, potable water, ballast/cargo water, fuel oil day tanks, drilling fluid. Cross-connections between all port and starboard tank pairs shall be kept closed at all times when underway. 6. Main deck hatches and weather doors to the forecastle and machinery spaces shall be kept closed and fully secured et all times when underway, except when actually used for transit under safe conditions. 7. Main deck freeing ports shall be maintained operable and completely unobstructed at all times. 8. Bilges shall be kept pumped to minimum content at all times. 9. Suitable tables or curves for determining the capacities of full or partially full tanks shall be maintained aboard the vessel. 10. The Master should make every effort to determine the cause of any list of the vessel before taking corrective action. It shall be the Master's responsibility to maintain the vessel in a satisfactory stability condition at all times. This stability letter shall be posted under suitable transparent material in the pilothouse of the vessel so that all pages and the diagram are visible. It supersedes any stability information previously furnished the vessel. . Sincerely, . A. B. SEA . Lieutenant Commander . U.S. Coast Guard Attachment: See Diagram DO36DG for the subject vessel bearing U.S. Coast Guard approval stamp dated 8 April 1987

REF636
Master, M/V SURVEYOR, O.N. 678678 13 May 87 Subj: M/V SURVEYOR Stability Dear Sir: A stability test, supervised by the U.S. Coast Guard, was conducted on the M/V SURVEYOR at New Orleans, Louisiana, on 7 May 1987. On the basis of this test, stability calculations have been performed. Results indicate that the stability of the M/V SURVEYOR, as presently outfitted and equipped, is satisfactory for operation in Ocean Service as indicated on the Certificate of Inspection, provided the following restrictions are strictly observed: 1. A maximum of 78 persons may be carried. In no case shall the number of persons exceed that allowed on the Certificate of Inspection. 2. The drafts as read on the draft marks shall not exceed 6 feet 3 inches forward or 7 feet 1 inch aft. Trim should be minimized. A loadline is not authorized. 3. The height above the main deck of the center of gravity of deck cargo shall not exceed 2.0 feet. Such cargo must be positively secured before leaving protected waters. 4. A maximum of 50 long tons of deck cargo may be carried when no other below deck ballast or cargo is carried. When rig water is carried, a maximum of 35 long tons of deck cargo may be carried, and no other below deck cargo or ballast is permitted. 5. No permanent ballast or other such weights shall be added, removed, altered, and/or relocated without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection. 6. No watertight bulkheads shall be removed or altered without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection. 7. The watertight door in the bulkhead at frame 18 shall be closed and properly dogged at all times when underway except when actually used for transit under safe conditions. 8. Cross-connections between all tank sets shall be kept closed at all times when underway. 9. Bilges shall be kept pumped to minimum content at all times. 10. Jet fuel may be carried on deck in eight DOT tanks. The total weight of the fuel and tanks shall not exceed 23.16 long tons and the vertical center of gravity shall not exceed 3 feet 6 inches above the deck. Such tanks must be positively secured against shifting in a seaway prior to leaving protected waters. Neither passengers nor other deck cargo shall be carried when such tanks are aboard the vessel. 11. The Master should make every effort to determine the cause of any list of the vessel before taking corrective action. It shall be the Master's responsibility to maintain the vessel in a satisfactory stability condition at all times. This temporary stability letter shall be posted under suitable transparent material in the pilothouse of the vessel so that all pages are visible. It supersedes any stability information previously furnished the vessel. Sincerely, W. T. DOOR Lieutenant Commander U.S. Coast Guard

REF637
$GM = (0.44 \times Beam / Time\ of\ roll)^2$

REF638
Synchronous rolling is caused by the ship's rolling period becoming synchronous or resonant with the wave period. When this occurs, the ship heels over and, in exceptional circumstances, is rolled further over by the action of the wave. ... It causes a twisting along the ship, leading to extra rolling motions

REF639
Use the weight shift formula to solve for shift in the center of gravity. Shift = weight x distance / displacement

REF640

Reference: Merchant Marine Officers Handbook Trimming Moments= (weight)(distance) Change in Trim= (Trimming Moments)/MTI Change in Trim= ((weight)(distance))/MTI 24”= ((weight)(250’))/500 ft-tons 12000=(weight)(250’) Weight= 48 tons

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REF707
Stability Problems Question Table: ST-0103

REF708
Stability Problems Question Table: ST-0158 See FSC SOLUTION FOR ST-158.pdf under assets tab.

REF709
Stability Problems Question Table: ST-0167

REF710
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Stability Problems Question Table: ST-0173

REF714
Stability Problems Question Table: ST-0174 See FSC SOLUTION FOR ST-174.pdf under assets tab. Step 1: Calculate Mean Draft. 15'-05"fwd + 21'-03" aft = 36'08" Mean Draft: 36'-08"/2 Mean Draft = 18'04" Step 2: Using the Hydrostatic Properties table (Sheet 3) for the SS American Mariner (White Pages), calculate the Total Displacement (S.W. Tons) for the vessel before loading bunkers with a mean draft of 18'04". The table yields 12,000 tons as the displacement of the vessel at 18'04" mean draft. Step 3: Add up all the bunker totals for each tank. The sum of all bunkers equals 3024.8 tons. Step 4: Add the displacement of the vessel before loading the bunkers and the sum of all the bunkers to find the ship's final displacement. 12,000 tons + 3024.8 tons = 15024.8 tons Step 5: Refer to the Table for Free Surface Correction and Tank Capacities (Sheet 4) to calculate the free surface moment for each tank. On the S.S. Mariner , a tank is considered

FULL if the tank is at least 97% full. Any quantity less than 97% full or an empty tank is considered SLACK. In the column F.O. Tons under Tank Capacity, the table gives you the capacity of each tank at 97% full. This is the column you will compare your loaded bunkers in each tank with to verify if a tank is considered FULL or SLACK. For example, DB 1 CL is loaded with 48.2 tons of bunkers. The tank capacity at 97% for D.B. 1 CL is 48.2 tons. Therefore, the tank is considered FULL and its free surface correction is 67. Conversely, D.B. 4 CL is loaded with 208.6 tons of bunkers. The tank capacity at 97% for D.B. 4 CL is 224.1 tons. Since 208.6 tons is less than 224.1 tons then D.B. 4 CL is considered SLACK. Net, find the total sum of free surface moment which equals 17,309 foot tons. Step 6: Find the free surface correction in feet by dividing the total free surface moment by the final displacement of the vessel. FS(corr) = 17,309 foot tons/15,024.8 tons FS(corr) = 1.15 feet

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Stability Problems Question Table: ST-0153

REF823
Stability Problems Question Table: ST-0002 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. 50 drums of cement. Each drum weighs 600 pounds and is stowed on end. Each drum measures 28 inches in diameter and is 32 inches high. II. Two reels of 1 inch diameter wire rope. Each reel contains 3000 linear feet of wire weighing 1.55 pounds per linear foot. The tare weight of each reel is 450 pounds. The reels are stowed on the flat and are 36 inches high. III. Twelve pallets of general supplies. Each pallet measures 8'L X 4'W X 3'H. The pallets are stowed singly and weigh 580 pounds each. IV. Twelve crates of machine parts and pipe fittings. Each weighs 880 pounds. Each crate measures 8'L X 3'W X 4'H and is stowed singly. Set up a table to categorize the known information.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
drums of cement	50		600		13.39 Tons		1.33 feet		17.85
wire rope	2		5100		4.55 Tons		1.50 feet		6.83
pallets	12		580		3.11 Tons		1.50 feet		4.67

crates	12	880	4.71 Tons	2.0 feet	9.42

Total Weight: 25.76 Tons Total Moment: 38.77

Divide the total moment by the total weight to determine the total height of the VCG. 38.77 ÷ 25.76 = 1.5050 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF824

Stability Problems Question Table: ST-0003 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. Drill casing - 16 inches in diameter by 30 feet long. Twenty lengths each weighing 1.72 long tons and stowed in a single tier on deck. II. Six pallets of oak planking - stowed two pallets high. Each pallet weighs 2.2 long tons. Each pallet is 3.0 feet high. III. Crated piping and machine parts - 8 crates each 8'L X 4'W X 3'H. Each crate is stowed singly and weighs 660 pounds. IV. Drill pipe - 6 inches in diameter by 30 feet long. 120 lengths, each weighing 0.644 long ton. The center of gravity of the pipes is 1.11 feet above the main deck. Set up a table to categorize the known information.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
Drill casing	20		1.72 LT		34.4 Tons		.66 feet		22.70
pallets of oak	6		2.2 LT		13.2 Tons		3.0 feet		39.6
Crated piping	8		660 LB		2.36 Tons		1.5 feet		3.53
Drill pipe	120		.644 LT		77.28 Tons		1.11 feet		85.78

Total Weight: 127.24 Tons Total Moment: 151.61

Divide the total moment by the total weight to determine the total height of the VCG. 151.61 ÷ 127.24 = 1.1915 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF825

Stability Problems Question Table: ST-0004 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. Drill casing - 50 lengths stowed in a block 8 feet high. Each pipe weighs 326 lbs. II. Crated valves - 10 crates stowed 2 high. Each crate is 36" L X 30" W X 15" H and weighs 1020 lbs. III. Dry stores - 14 containers stowed 2 high. Each container weighs 2 long tons and measures 6'L X 6'W X 6'H. IV. Anchors - 4. Each one on deck. The center of gravity of each anchor is 9" from the deck and each weighs 6120 lbs.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
Drill casing	50		326 LB		7.27 Tons		4.0 feet		29.08
Crated valves	10		1020 LB		4.55 Tons		1.25 feet		5.68
Dry stores	14		2 LT		28 Tons		6.0 feet		168.0
Anchors	4		6120 LB		10.92 Tons		.75 feet		8.19

Total Weight: 50.74 Tons Total Moment: 210.95

Divide the total moment by the total weight to determine the total height of the VCG. 210.95 ÷ 50.74 = 4.1574 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF826

Stability Problems Question Table: ST-0015 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. Two reels of hoisting wire. Each reel is 8 feet in circumference and 4 feet wide and has 3000 feet of wire. Both reels are stowed on the flat. Wire weighs 1.55 pounds per linear foot. The tare weight of each reel is 500 pounds. II. Eight pallets of case goods stowed singly. Each pallet is 8'L X 4'W X 4'H and weighs 1 long ton. III. 12 steel containers of cement. Each container weighs 1 1/2 tons. Each container is 8'L X 4'W X 4'H. The containers are stowed singly fore and aft. IV. 10 crates of stewards stores. Each crate measures 4'L X 4'W 3'H and weighs 420 pounds. Each crate is stowed on deck.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
hoisting wire	2		5150 LB		4.59 Tons		2.0 feet		9.2
pallets	8		1 LT		8 Tons		2.0 feet		16

steel containers	12	1.5 LT	18 Tons	2.0 feet	36.0
crates	10	420 LB	1.87 Tons	1.5 feet	2.8
			Total Weight: 32.46 Tons		Total Moment: 64.0

Divide the total moment by the total weight to determine the total height of the VCG. 64 ÷ 32.46 = 1.971 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF827
Stability Problems Question Table: ST-0018 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. Twenty drums of lube oil stowed on end. Each drum weighs 436 pounds. Diameter of drums is 24 inches and their height is 30 inches overall. II. General supplies - 26 boxes stowed 2 high. Each box weighs 360 pounds and measures 6'L X 3'W X 2'H. III. One electric generator weighing 2684 lbs. Stowed so the center of gravity is 3.2 feet above the main deck. IV. Casing pipe - 29 each. Each pipe weighs 1.7 long tons. The pipe is stacked 3 high across the main deck. The center of gravity of the 10 casings in the 3rd tier is 3.75 feet; the 9 casings in the second tier is 2.3 feet; the 10 casings in the lower tier is 0.833 foot.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
drums	20		436 LB		3.89 Tons		1.25 feet		4.86
supplies	26		360 LB		4.17 Tons		2.0 feet		8.34
generator	1		2684 LB		1.19 Tons		3.2 feet		3.83
Casing pipe 1	10		1.7 LT		17 Tons		3.75 feet		63.75
Casing pipe 2	9		1.7 LT		15.3 Tons		2.3 feet		35.19
Casing pipe 3	10		1.7 LT		17 Tons		0.833 feet		14.16
					Total Weight: 58.55 Tons				Total Moment: 130.133

Divide the total moment by the total weight to determine the total height of the VCG. 130.133 ÷ 58.55 = 2.222 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF828
Stability Problems Question Table: ST-0019 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. 2 Danforth mooring anchors. Each anchor weighs 15,750 pounds. The center of gravity is 15 inches above the main deck. II. 90 fathoms of 3-inch diameter wire rope. The weight per linear foot is 18.7 pounds. The center of gravity of the wire is 22 inches above the main deck. III. 10 cases of machine parts. Each case measures 6'L X 6'W X 4'H. The total weight of all of the cases is 6000 lbs. Each case is stowed on deck. IV. 8 crates of galley stores. Each crate measures 4'L X 3'W X 2.5'H and weighs 380 pounds. Each crate is stowed on deck.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
anchors	2		15750 LB		14.06 Tons		1.25 feet		17.57
wire rope	540'		18.7 LB		4.51 Tons		1.83 feet		8.25
machine parts	10		6000 LB		2.68 Tons		2.0 feet		5.36
galley stores	8		380 LB		1.36 Tons		1.25 feet		1.7
					Total Weight: 22.61 Tons				Total Moment: 32.88

Divide the total moment by the total weight to determine the total height of the VCG. 32.88 ÷ 22.61 = 1.454 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF829
Stability Problems Question Table: ST-0020 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. Two reels of hoisting wire. Each reel is 8 feet in circumference and 4 feet wide. Both reels are stowed on the flat and each has 3000 feet of wire. Wire weighs 1.55 pounds per linear foot. Tare weight of each reel is 500 pounds. II. Eight pallets of case goods stowed singly. Each pallet is 8'L X 4'W X 4'H and weighs 1 long ton. III. 12 steel containers of cement. Each container weighs 1 1/2 long tons. Each container is 8'L X 4'W 4'H. The containers are stowed singly fore and aft. IV. 10 crates of stewards stores. Each crate measures 4'L X 4'W X 3'H and weighs 420 pounds. Each crate is stowed on deck.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Momen
hoisting wire	2		5150 LB		4.60 Tons		2.0 feet		9.20
case goods	8		1 LT		8 Tons		2.0 feet		16
containers of cement	12		1.5 LT		18 Tons		2.0 feet		36
stewards stores	10		420 LB		1.87 Tons		1.5 feet		2.81
			Total Weight:		32.47 Tons		Total Moment:		64.01

Divide the total moment by the total weight to determine the total height of the VCG. 64.01 ÷ 32.47 = 1.971 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF830
Stability Problems Question Table: ST-0027 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. Motor generator - one unit weighing 4850 pounds. The center of gravity is 32 inches above the main deck. II. 50 drums of cement - each drum weighs 400 pounds and is stowed on end. Each drum is 28 inches in diameter and 32 inches high. III. Ten pallets of cased lube oil - each pallet measures 8'L X 4'W X 4'H. Each pallet is stowed on deck and weighs 2.7 long tons. IV. Drill collars - 10 lengths each 8" in diameter by 30 feet long. Stowed in a single layer on deck. Each length weighs 1.15 long tons.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
generator	1		4850 LB		2.17 Tons		2.6 feet		5.79
drums of cement	50		400 LB		8.93 Tons		1.33 feet		11.90
pallets lube oil	10		2.7 LT		27 Tons		2.0 feet		54.00
Drill collars	10		1.15 LT		11.5 Tons		.33 feet		3.83
			Total Weight:		49.6 Tons		Total Moment:		75.52

Divide the total moment by the total weight to determine the total height of the VCG. 75.52 ÷ 49.6 = 1.522 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF831
Stability Problems Question Table: ST-0030 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds. I. Intermediate drill casing - 10 lengths each 16 inches in diameter. Each length weighs 1.7 long tons. The center of gravity above the main deck of the casing stow is 1.8 feet. II. Crated machine parts and assorted pipe fittings - 6 crates stowed two high. Each crate is 4'L X 3.5'W X 3'H. Each crate weighs 840 lbs. III. 10 each - 55 gallon drums of lube oil stowed on end. Each drum weighs 462 pounds, is 26 inches in diameter and 32 inches high. IV. Dry stores - 12 containers stowed two high. Each container weighs 0.9 long ton and measures 6'L X 4'W X 3'H.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
drill casing	10		1.7 LT		17 Tons		1.8 feet		30.6
machine parts	6		840 LB		2.25 Tons		3.0 feet		6.75
drums of lube	10		462 LB		2.06 Tons		1.33 feet		2.74
Dry stores	12		.9 LT		10.8 Tons		3.0 feet		32.4
			Total Weight:		32.11 Tons		Total Moment:		72.49

Divide the total moment by the total weight to determine the total height of the VCG. 72.49 ÷ 32.11 = 2.257 feet Tare weight /■t■■r/, sometimes called unladen weight, is the weight of an empty vehicle or container. By subtracting it from the gross weight (laden weight), the weight of the goods carried (the net weight) may be determined.

REF832
Stability Problems Question Table: ST-0036 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds.

I. 50 drums of cement - each drum weighs 400 pounds and is stowed on end. Each drum is 28 incl

II. Crated piping and valves - 8 crates stowed 2 high. Each crate measures 8'L X 4'W X 2.5'H a

III. Stewards stores - 12 containers measuring 6'H X 6'W X 6'L. Each container weighs 960 pou
above the main deck.

IV. 20 lengths of drill casing - 16 inches in diameter by 30 feet long. Each length weighs 1.
Set up a table to categorize the known information.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
Cement	50		400		8.9 Tons		16" 1.33 feet		11.837
Piping and Valves	8		640		2.29 Tons		2.5 feet		5.725
Steward Stores	12		960		5.14 Tons		30" 2.5 feet		12.850
Drill Casing	20		1.72 T		34.4 Tons		8" 0.67 feet		23.040
				Total Weight:	50.73 Tons			Total Moment:	53.452

Divide the total moment by the total weight to determine the total height of the VCG. 53.452 ÷ 50.73 = 1.05 feet

REF833
Stability Problems Question Table: ST-0039 Organize the known information. Convert the given information to consistent terms of measure, height, and weight. Note that 1 ton = 2240 pounds.

I. 116 lengths of drill pipe. Each pipe weighs 0.644 long ton. The center of gravity is 1.11

II. 10 containers 8'L X 4'W X 3'H containing assorted pipe fittings and machine parts. Each c

III. Two 90-fathom lengths of 3-inch diameter wire rope coiled on the main deck. Each foot of

IV. 6 pallets of oak planking. Each pallet weighs 2-1/2 long tons with a center of gravity of
Set up a table to categorize the known information.

Category	Units	X	Weight	=	Total Weight	X	Height of VCG	=	Moment
drill pipe	116		0.644		74.7 Tons		1.11 feet		82.92
containers	108		1.25 LT		2.29 Tons		1.35 feet		3.09
wire rope	2		4.5 LT		9.00 Tons		2.25 feet		20.25
oak planking	6		2.5 LT		15 Tons		2.2 feet		33.00
				Total Weight:	100.99 Tons			Total Moment:	139.26

Divide the total moment by the total weight to determine the total height of the VCG. 139.26 ÷ 100.99 = 1.378 feet

REF834
HEEL - A heel is a "temporary" inclination of a ship, caused by outside forces such as winds, waves, or during a ship's turn.

REF835
Note: Any time a vessel pitches or rolls, the vessel's stability is adversely affected by any virtual rise in the center of gravity. This is caused by movement of liquid contents within partially flled tanks. The virtual rise in the center of gravity is a function of what is known as the free surface effect. Free surface is the surface area of liquid in tanks not in contact with tank boundaries as a vessel pitches or rolls. Transverse stability may be adversely affected by rolling action and longitudinal stability by pitching action due to the free surface effect.

REF836
Angle of loll is the state of a ship that is unstable when upright (i.e. has a negative metacentric height) and therefore takes on an angle of heel to either port or starboard. When a vessel has negative metacentric height (GM) i.e., is in unstable equilibrium, any external force applied to the vessel will cause it to start heeling. As it heels, the moment of inertia of the vessel's waterplane (a plane intersecting the hull at the water's surface) increases, which increases the vessel's BM (distance from the centre of Buoyancy to the Metacenter). Since there is relatively little change in KB (distance from the Keel to the centre of Buoyancy) of the vessel, the KM (distance from Keel to the Metacentre) of the vessel increases. At some angle of heel (say 10°), KM will increase sufficiently equal to KG (distance from the keel to the centre of gravity), thus making GM of vessel equal to zero. When this occurs, the vessel goes to neutral equilibrium, and the angle of heel at which it happens is called angle of loll. In other words, when an unstable vessel heels over towards a progressively

increasing angle of heel, at a certain angle of heel, the centre of buoyancy (B) may fall vertically below the centre of gravity (G). Angle of list should not be confused with angle of loll. Angle of list is caused by unequal loading on either side of centre line of vessel. Although a vessel at angle of loll does display features of stable equilibrium, this is a dangerous situation and rapid remedial action is required to prevent the vessel from capsizing.[1][2][3][4] It is often caused by the influence of a large free surface or the loss of stability due to damaged compartments. It is different from list in that the vessel is not induced to heel to one side or the other by the distribution of weight, it is merely incapable of maintaining a zero heel attitude.

REF837
Capsize: To "turn turtle" due to loss of transverse stability. Righting Arm: The distance between the line of force through B and the line of force through G, when there is positive stability.

REF838
CENTER OF BUOYANCY : The geometric center of gravity of the immersed volume of the displacement or of the displaced water, determined solely by the shape of the underwater body of the ship. It is calculated for both the longitudinal location, forward or aft of the middle perpendicular, and the vertical location above the base line or below the designed waterline.

REF839
Center of Gravity: That point at which all the vertically downward forces of weight are considered to be concentrated; the center of the mass of the vessel.

REF840
GM: Metacentric height; distance from the center of gravity to the metacenter.

REF841
KG: Height of center of gravity above keel.

REF842
Metacenter: The highest point to which G may rise and still permit the vessel to have positive stability. Found at the intersection of the line of action of B when the ship is erect with the line of action of B when the ship is given a small inclination. Center of Gravity: That point at which all the vertically downward forces of weight are considered to be concentrated; the center of the mass of the vessel. The center of buoyancy is the geometric center of the displaced fluid and is computed in the same way as the center of mass is, and knowing where both the center of mass and center of buoyancy are is important for the stability of a floating object.

REF843
Metacenter: The highest point to which G may rise and still permit the vessel to have positive stability. Found at the intersection of the line of action of B when the ship is erect with the line of action of B when the ship is given a small inclination.

REF844
Metacentric Height: Distance between G and M. Used as a measure of initial stability.

REF845
Reference: William E. George: Stability and Trim for the Ship’s Officer, Fourth Edition The accumulation of ice high on the vessel will increase the displacement and the center of gravity will rise decreasing the GM.

REF846
Righting Moment: The product of the weight of the vessel (displacement) and the righting arm (GZ).

REF847
Stiff Ship: Vessel with low center of gravity and large metacentric height.

REF848
TRANSVERSE : At right angles to the ship's fore-and-aft center line. Moment: Created by a force or weight moved through a distance.

REF849
Transverse Center of Gravity is referenced in the transverse (athwartship) direction from the centerline of the ship and is labeled TCG.

REF850
Vertical Center of Gravity (VCG): The vertical height of the center of gravity of a compartment above its bottom, or of the center of gravity of a vessel above its keel. Vertical Center of Gravity is a term that may be applied to your entire vessel. The term may also be applied to any individual tank, compartment or weight on or within your vessel. Consequently, VCG may be given a dual definition as the 1) vertical height of the center of gravity of the contents of any tank or compartment above its bottom, or 2) the vertical height of the center of gravity of the entire vessel above its keel.

REF851
The angle of list is the degree to which a vessel heels (leans or tilts) to either port or starboard at equilibrium—with no external forces acting upon it. Listing is caused by the off-centerline distribution of weight aboard due to uneven loading or to flooding.

REF852
Angle of loll is the state of a ship that is unstable when upright (i.e. has a negative metacentric height) and therefore takes on an angle of heel to either port or starboard. When a vessel has negative metacentric height (GM) i.e., is in unstable equilibrium, any external force applied to the vessel will cause it to start heeling. As it heels, the moment of inertia of the vessel's waterplane (a plane intersecting the hull at the water's surface) increases, which increases the vessel's BM (distance from the centre of Buoyancy to the Metacenter). Since there is relatively little change in KB (distance from the Keel to the centre of Buoyancy) of the vessel, the KM (distance from Keel to the Metacentre) of the vessel increases. At some angle of heel (say 10°), KM will increase sufficiently equal to KG (distance from the keel to the centre of gravity), thus making GM of vessel equal to zero. When this occurs, the vessel goes to neutral equilibrium, and the angle of heel at which it happens is called angle of loll. In other words, when an unstable vessel heels over towards a progressively increasing angle of heel, at a certain angle of heel, the centre of buoyancy (B) may fall vertically below the centre of gravity (G). Angle of list should not be confused with angle of loll. Angle of list is caused by unequal loading on either side of centre line of vessel. Although a vessel at angle of loll does display features of stable equilibrium, this is a dangerous situation and rapid remedial action is required to prevent the vessel from capsizing. It is often caused by the influence of a large free surface or the loss of stability due to damaged compartments. It is different from list in that the vessel is not induced to heel to one side or the other by the distribution of weight, it is merely incapable of maintaining a zero heel attitude.

REF853
Stiff Ship: Vessel with low center of gravity and large metacentric height. Tender or Crank Ship: A vessel with small metacentric height; top-heavy.

REF854
When the object is lifted, the center of gravity of the object shifts to the head of the boom, causing a rise in the center of gravity and loss of stability.

REF855
Down by the head, Down by the stern, On even keel. These expressions mean: 1.The draught forward exceeds the draught aft. Such a “trim” will have a detrimental effect upon the ship’s speed and steering. 2.The draught aft exceeds the draught forward. In most cases a certain drag is preferable in connection with the steering of the ship. Too much drag may result in loss of speed. Ships sailing in ballast may need to be trimmed by the stern 1 to 1.5 metres so that the propeller will be sufficiently immersed, say at least two thirds of the diameter, otherwise the power developed may be wasted.

REF856
SHEAR STRESS: Is defined as a stress which is applied parallel or tangential to a face of a material, as opposed to a normal stress which is applied perpendicularly.

REF857
Tensile stress (or tension): Is the stress state leading to expansion; that is, the length of a material tends to increase in the tensile direction. The volume of the material stays constant. Therefore in a uniaxial material the length increases in the tensile stress direction and the other two directions will decrease in size. In the uniaxial manner of tension, tensile stress is induced by pulling forces. Tensile stress is the opposite of compressive stress. Structural members in direct tension are

ropes, soil anchors and nails, bolts, etc. Beams subjected to bending moments may include tensile stress as well as compressive stress and/or shear stress. Tensile stress may be increased until the reach of tensile strength, namely the limit state of stress.

REF858
Racking When a ship is rolling in a seaway or is struck by beam waves, the ship's structure is liable to distort in a transverse direction. The stress mainly affects the corners of the ship, i.e., on the tank side brackets and the beam knees, which must be made strong enough to resist it. Transverse bulkheads, frames and web frames provide very great strength to resist racking.