1. A vessel heading ENE is on a course of __________.
   A. 022.5°  C. 067.5°
   B. 045.0°  D. 090.0°

2. A vessel heading ESE is on a course of __________.
   A. 112.5°  C. 157.5°
   B. 135.0°  D. 180.0°

3. A vessel heading NE is on a course of __________.
   A. 022.5°  C. 067.5°
   B. 045.0°  D. 090.0°

4. A vessel heading NNE is on a course of __________.
   A. 022.5°  C. 067.5°
   B. 045.0°  D. 090.0°

5. A vessel heading NNW is on a course of __________.
   A. 274.5°  C. 315.5°
   B. 292.0°  D. 337.5°

6. A vessel heading NW is on a course of __________.
   A. 274.5°  C. 315.0°
   B. 292.5°  D. 337.5°

7. A vessel heading SE is on a course of __________.
   A. 112.5°  C. 157.5°
   B. 135.0°  D. 180.0°

8. A vessel heading SSE is on a course of __________.
   A. 112.5°  C. 157.5°
   B. 135.0°  D. 180.0°

9. A vessel heading SSW is on a course of __________.
   A. 202.5°  C. 247.5°
   B. 225.0°  D. 270.0°

10. A vessel heading SW is on a course of __________.
    A. 202.5°  C. 247.5°
    B. 225.0°  D. 270.0°

11. A vessel heading WNW is on a course of __________.
    A. 270.0°  C. 315.0°
    B. 292.5°  D. 337.5°
12. A vessel heading WSW is on a course of __________.
   A. 202.5°  
   B. 225.0°  
   C. 247.5°  
   D. 271.0°

13. Deviation is the angle between the __________.
   A. true meridian and the axis of the compass card  
   B. true meridian and the magnetic meridian  
   C. magnetic meridian and the axis of the compass card  
   D. axis of the compass card and the degaussing meridian

14. If the compass heading and the magnetic heading are the same then __________.
   A. the deviation has been offset by the variation  
   B. there is something wrong with the compass  
   C. the compass is being influenced by nearby metals  
   D. there is no deviation on that heading

15. If the magnetic heading is greater than the compass heading, the deviation is __________.
   A. east  
   B. west  
   C. north  
   D. south

16. Magnetic compass deviation __________.
   A. varies depending upon the bearing used  
   B. is the angular difference between magnetic north and compass north  
   C. is published on the compass rose on most nautical charts  
   D. is the angular difference between geographic and magnetic meridians

17. The difference between magnetic heading and compass heading is called __________.
   A. variation  
   B. deviation  
   C. compass error  
   D. drift

18. The horizontal angle between the magnetic meridian and the north-south line of the magnetic compass is __________.
   A. deviation  
   B. variation  
   C. compass error  
   D. dip

19. Compass deviation is caused by __________.
   A. magnetism from the earth's magnetic field  
   B. misalignment of the compass  
   C. magnetism within the vessel  
   D. a dirty compass housing

20. Deviation in a compass is caused by the __________.
   A. vessel's geographic position  
   B. vessel's heading  
   C. earth's magnetic field  
   D. influence of the magnetic materials of the vessel
21 Ref: Compass, CE, Deviation, Cause
Deviation is caused by __________.
A. changes in the earth's magnetic field
B. nearby magnetic land masses or mineral deposits
C. magnetic influence inherent to that particular vessel
D. the magnetic lines of force not coinciding with the lines of longitude

22 Ref: Compass, CE, Deviation, Cause
Error may be introduced into a magnetic compass by __________.
A. making a structural change to the vessel
B. a short circuit near the compass
C. belt buckles
D. All of the above

23 Ref: Compass, CE, Deviation, Cause
Which would influence a magnetic compass?
A. Electrical wiring
B. Iron pipe
C. Radio
D. All of the above

24 Ref: Compass, CE, Deviation, Heading
The compass deviation changes as the vessel changes __________.
A. geographical position
B. speed
C. heading
D. longitude

25 Ref: Compass, CE, Variation, Agonic
On an isomagnetic chart, the line of zero variation is the __________.
A. zero variation line
B. isogonic line
C. variation line
D. agonic line

26 Ref: Compass, CE, Variation, Agonic
The agonic line on an isomagnetic chart indicates the __________.
A. magnetic equator
B. magnetic longitude reference line
C. points where there is no variation
D. points where there is no annual change in variation

27 Ref: Compass, CE, Variation, Annual Change
The chart indicates the variation was 3°45'E in 1988, and the annual change is increasing 6'. If you use the chart in 1991 how much variation should you apply?
A. 3°27'E
B. 3°27'W
C. 3°45'E
D. 4°03'E

28 Ref: Compass, CE, Variation, Annual Change
The chart indicates the variation was 3°45'W in 1988, and the annual change is decreasing 6'. If you use the chart in 1991 how much variation should you apply?
A. 3°27'W
B. 3°27'E
C. 4°03'W
D. 4°03'E

29 Ref: Compass, CE, Variation, Annual Change
The chart indicates the variation was 3°45'W in 1988, and the annual change is increasing 6'. If you use the chart in 1991 how much variation should you apply?
A. 3°27'W
B. 3°27'E
C. 4°03'W
D. 4°03'E
30. 866  Ref: Compass, CE, Variation, Annual Change  
The compass rose on a nautical chart indicates both variation and __________.  
A. deviation  C. precession  
B. annual rate of variation change  D. compass error  

31. 644  Ref: Compass, CE, Variation, Isogonic  
Isogonic lines are lines on a chart indicating __________.  
A. points of equal variation  C. the magnetic latitude  
B. points of zero variation  D. magnetic dip  

32. 653  Ref: Compass, CE, Variation, Isogonic  
Lines on a chart which connect points of equal magnetic variation are called __________.  
A. magnetic latitudes  C. dip  
B. magnetic declinations  D. isogonic lines  

33. 661  Ref: Compass, CE, Variation, Location  
Magnetic variation changes with a change in __________.  
A. the vessel's heading  C. seasons  
B. sea conditions  D. the vessel's position  

34. 1343  Ref: Compass, CE, Variation, Location  
Variation in a compass is caused by __________.  
A. worn gears in the compass housing  C. magnetism within the vessel  
B. magnetism from the earth's magnetic field  D. lack of oil in the compass bearings  

35. 1345  Ref: Compass, CE, Variation, Location  
Variation is not constant; it is different with every change in __________.  
A. speed  C. geographical location  
B. vessel heading  D. cargo  

36. 902  Ref: Compass, CE, Variation, M to T  
The difference in degrees between true north and magnetic north is called __________.  
A. variation  C. drift  
B. deviation  D. compass error  

37. 1299  Ref: Compass, CE, Variation, M to T  
True heading differs from magnetic heading by __________.  
A. deviation  C. compass error  
B. variation  D. northerly error  

38. 1346  Ref: Compass, CE, Variation, M to T  
Variation is the angular measurement between __________.  
A. compass north and magnetic north  
B. compass north and true north  
C. magnetic meridian and the geographic meridian  
D. your vessel's heading and the magnetic meridian  

39. 1344  Ref: Compass, CE, Variation  
Variation is a compass error that you __________.  
A. can correct by adjusting the compass card  
B. can correct by adjusting the compensating magnets  
C. can correct by changing the vessel's heading  
D. cannot correct
40 385 Ref: Compass, CE
Compass error is equal to the __________.
A. deviation minus variation  C. combined variation and deviation
B. variation plus compass course  D. difference between true and magnetic heading

41 485 Ref: Compass, CE
If a magnetic compass is not affected by any magnetic field other than the Earth's, which statement is TRUE?
A. Compass error and variation are equal.  C. Variation will equal deviation.
B. Compass north will be true north.  D. There will be no compass error.

42 865 Ref: Compass, CE
The compass error of a magnetic compass that has no deviation is __________.
A. zero  C. eliminated by adjusting the compass
B. equal to variation  D. constant at any geographical location

43 1213 Ref: Compass, CE
The standard magnetic compass heading differs from the true heading by __________.
A. compass error  C. variation
B. latitude  D. deviation

44 1289 Ref: Compass, CE
To find a magnetic compass course from a true course you must apply __________.
A. deviation  C. variation
B. deviation and variation  D. magnetic anomalies (local disturbances)

45 1566 Ref: Compass, CE
When changing from a compass course to a true course you should apply __________.
A. variation  C. variation and deviation
B. deviation  D. a correction for the direction of current set

46 1975 Ref: Compass, CE
You are proceeding up a channel at night. It is marked by a range which bears 185°T. You steady up on a compass course of 180° with the range in line dead ahead. This indicates that you(r) __________.
A. must come right to get on the range  C. compass has some easterly error
B. course is in error  D. are being affected by a southerly current

47 109 Ref: Compass, Compass Card
A magnetic compass card is marked in how many degrees?
A. 90  C. 360
B. 180  D. 400

48 301 Ref: Compass, Compass Card
As a vessel changes course to starboard, the compass card in a magnetic compass __________.
A. remains aligned with compass north  C. also turns to starboard
B. also turns to starboard  D. turns counterclockwise to port

49 1555 Ref: Compass, General
When a magnetic compass is not in use for a prolonged period of time it should __________.
A. be shielded from direct sunlight  C. have any air bubbles replaced with nitrogen
B. be locked into a constant heading  D. have the compensating magnets removed
If the gyrocompass error is east, what describes the error and the correction to be made to gyrocompass headings to obtain true headings?
A. The readings are too low (small numerically) and the amount of the error must be added to the compass to obtain true
B. The readings are too low and the amount of the error must be subtracted from the compass to obtain true
C. The readings are too high (large numerically) and the amount of the error must be added to the compass to obtain true
D. The readings are too high and the amount of the error must be subtracted from the compass to obtain true

A system of reservoirs and connecting tubes in a gyro compass is called a __________.
A. spider element C. gyrotron
B. mercury ballistic D. rotor

At the master gyrocompass, the compass card is attached to the __________.
A. spider element C. link arm
B. sensitive element D. pickup transformer

Gyrocompass repeaters reproduce the indications of the master gyrocompass. They are __________.
A. accurate only in the Polar regions C. hand operated
B. accurate electronic servomechanisms D. accurate only if the vessel is underway

Indications of the master gyrocompass are sent to remote repeaters by the __________.
A. follow-up system C. phantom element
B. transmitter D. azimuth motor

The directive force of a gyrocompass __________.
A. increases with latitude, being maximum at the geographic poles
B. decreases with latitude, being maximum at the geographic equator
C. is greatest when a vessel is near the Earth's magnetic equator
D. remains the same at all latitudes

The gyrocompass error resulting from your vessel's movement in OTHER than an east-west direction is called __________.
A. damping error C. quadrant error
B. ballistic deflection D. speed error

The most accurate method of determining gyrocompass error while underway is by __________.
A. comparing the gyro azimuth of a celestial body with the computed azimuth of the body
B. comparing the gyro heading with the magnetic compass heading
C. determining from the chart the course made good between celestial fixes
D. It cannot be determined accurately at sea due to drift of unknown currents.

The reaction of a gyrocompass to an applied force is known as __________.
A. precession C. gyroscopic inertia
B. earth rate D. gravity effect
59  1208  Ref: Compass, Gyrocompass  A
The spin axis of a gyroscope tends to remain fixed in space in the direction in which it is started. How does this gyroscope become north seeking so that it can be used as a compass?
A. By mechanically or electrically applying forces to precess the gyroscope
B. By starting the compass with the spin axis in a north/south position
C. By taking advantage of the property of gyroscopic inertia
D. The rotation of the Earth (Earth rate) automatically aligns the gyroscope with north, except for speed errors

60  1765  Ref: Compass, Gyrocompass  A
Which statement about gyrocompass error is TRUE?
A. The amount of the error and the sign will generally be the same on all headings.
B. The sign (E or W) of the error will change with different headings of the ship.
C. Any error will remain constant unless the compass is stopped and restarted.
D. Any error shown by a gyro repeater will be the same as the error of the master compass.

61  1769  Ref: Compass, Gyrocompass  A
Which statement about the gyrocompass is FALSE?
A. Its accuracy remains the same at all latitudes.
B. It seeks the true meridian.
C. It can be used near the Earth's magnetic poles.
D. If an error exists, it is the same on all headings.

62  37  Ref: Compass, Instrument, Pelorus  B
A compass card without north-seeking capability that is used for relative bearings is a(n) __________.
A. bearing circle  C. bearing bar
B. pelorus  D. alidade

63  659  Ref: Compass, Magnetism, Dip  C
Magnetic dip is a measurement of the angle between the __________.
A. geographic pole and the magnetic pole  C. horizontal and the magnetic line of force
B. lubber's line and true north  D. compass heading and the magnetic heading

64  1052  Ref: Compass, Magnetism, Dip  B
The line connecting the points of the earth's surface where there is no dip is the __________.
A. agonic line  C. isodynamic
B. magnetic equator  D. isopor

65  1055  Ref: Compass, Magnetism, Dip  B
The line which connects the points of zero magnetic dip is __________.
A. an agonic line  C. a magnetic meridian
B. the magnetic equator  D. All of the above

66  1137  Ref: Compass, Magnetism, Dip  D
The points on the earth's surface where the magnetic dip is 90° are __________.
A. along the magnetic equator  C. the isopors
B. connected by the isoclinal line  D. the magnetic poles

67  1260  Ref: Compass, Magnetism, Dip  D
The vertical angle between the horizontal and the magnetic line of force is the __________.
A. elevation  C. vertical angle
B. magnetic angle  D. dip
68 486 Ref: Compass, Magnetism, Equator
If a ship is proceeding towards the magnetic equator, the uncorrected deviation due to permanent magnetism __________.
A. increases C. decreases
B. remains the same D. is unimportant and may be neglected

69 974 Ref: Compass, Magnetism, Equator
The greatest directive force is exerted on the magnetic compass when the __________.
A. needles are nearly in line with the meridian C. variation is near zero
B. vessel is near the magnetic poles D. vessel is near the magnetic equator

70 1069 Ref: Compass, Magnetism, Equator
The magnetic compass magnets are acted on by the horizontal component of the Earth's total magnetic force. This magnetic force is GREATEST at the __________.
A. north magnetic pole C. magnetic prime vertical meridian
B. south magnetic pole D. magnetic equator

71 332 Ref: Compass, Magnetism, Induced
At the magnetic equator there is no induced magnetism in the vertical soft iron because __________.
A. the lines of force cross the equator on a 0°-180° alignment
B. the quadrantal error is 0°
C. there is no vertical component of the Earth's magnetic field
D. the intercardinal headings have less than 1° error

72 626 Ref: Compass, Magnetism, Induced
Induced magnetism is found in __________.
A. hard iron C. vertical iron only
B. soft iron D. horizontal iron only

73 662 Ref: Compass, Magnetism, Induced
Magnetism which is present only when the material is under the influence of an external field is called __________.
A. permanent magnetism C. residual magnetism
B. induced magnetism D. terrestrial magnetism

74 743 Ref: Compass, Magnetism, Permanent
Permanent magnetism is caused by __________.
A. operation of electrical equipment and generators on board ship
B. the earth's magnetic field affecting the ship's hard iron during construction
C. the horizontal component of the earth's magnetic field acting on the horizontal soft iron
D. the vertical component of the earth's magnetic field acting on the vertical soft iron

75 955 Ref: Compass, Magnetism, Permanent
The Flinders bar and the quadrant spheres should be tested for permanent magnetism at what interval?
A. They are not subject to permanent magnetism; no check is necessary.
B. Semiannually
C. Annually
D. Every five years

76 1127 Ref: Compass, Magnetism, Permanent
The permanent magnetism of a vessel may change in strength due to __________.
A. a collision with another vessel
B. being moored on a constant heading for a long period of time
C. being struck by lightning
D. All of the above
<table>
<thead>
<tr>
<th>Question</th>
<th>Ref: Compass, Magnetism</th>
<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>77</td>
<td>By convention, the Earth's north magnetic pole is colored _______.</td>
<td>C blue</td>
</tr>
<tr>
<td>78</td>
<td>By convention, the Earth's south magnetic pole is colored _______.</td>
<td>D red</td>
</tr>
<tr>
<td>79</td>
<td>By convention, the north pole of a magnet is painted _______.</td>
<td>A red</td>
</tr>
<tr>
<td>80</td>
<td>By convention, the north seeking ends of a compass' magnets are colored _______.</td>
<td>C red</td>
</tr>
<tr>
<td>81</td>
<td>By convention, the south pole of a magnet is painted _______.</td>
<td>B blue</td>
</tr>
<tr>
<td>82</td>
<td>By convention, the south seeking ends of a compass' magnets are colored _______.</td>
<td>A blue</td>
</tr>
<tr>
<td>83</td>
<td>The magnetic compass operates on the principle that _______.</td>
<td>C unlike poles attract</td>
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<tr>
<td>84</td>
<td>The permanent magnetism of a vessel may change in polarity due to _______.</td>
<td>B being struck by lighting</td>
</tr>
<tr>
<td>85</td>
<td>The permanent magnetism of a vessel may change in strength due to _______.</td>
<td>C major structural repair</td>
</tr>
<tr>
<td>86</td>
<td>What is an advantage of the magnetic compass aboard vessels?</td>
<td>C All points on the compass rose are readily visible.</td>
</tr>
</tbody>
</table>

Navigation General

General Compass Questions

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87 1427 Ref: Compass, Magnetism
What is the basic principle of the magnetic compass?
A. Magnetic materials of the same polarity repel each other and those of opposite polarity attract.
B. The Earth's magnetic lines of force are parallel to the surface of the Earth.
C. Magnetic meridians connect points of equal magnetic variation.
D. The compass needle(s) will, when properly compensated, lie parallel to the isogonic lines of the Earth.

88 1089 Ref: Compass, Part, Binnacle
The MOST important feature of the material used for making the binnacle of a standard magnetic compass is that it is __________.
A. nonmagnetic
B. weatherproof
C. corrosion resistant
D. capable of being permanently affixed to the vessel

89 976 Ref: Compass, Part, Lubbers Line
The heading of a vessel is indicated by what part of the compass?
A. Card
B. Needle
C. Lubber's line
D. Gimbals

90 1064 Ref: Compass, Part, Lubbers Line
The lubber's line on a magnetic compass indicates __________.
A. compass north
B. the direction of the vessel's head
C. magnetic north
D. a relative bearing taken with an azimuth circle

91 1241 Ref: Compass, Adjustment, Coefficients
The total magnetic effects which cause deviation of a vessel's compass can be broken down into a series of components which are referred to as __________.
A. divisional parts
B. coefficients
C. fractional parts
D. equations

92 1158 Ref: Compass, Adjustment, Dampen Deviation
The principal purpose of magnetic compass adjustment is to __________.
A. reduce the variation as much as possible
B. reduce the deviation as much as possible
C. reduce the magnetic dip as much as possible
D. allow the compass bowl to swing freely on its gimbals

93 1560 Ref: Compass, Adjustment, Deviation Table
When adjusting a magnetic compass for error, a deviation table should be made __________.
A. before correcting for any deviation
B. after correcting for variation
C. after adjusting the fore-and-aft and athwartships permanent magnets
D. before the quadrantal correctors are placed on the compass

94 956 Ref: Compass, Adjustment, Flinders Bar
The Flinders bar on a magnetic compass compensates for the __________.
A. induced magnetism in vertical soft iron
B. induced magnetism in horizontal soft iron
C. permanent magnetism in ship's steel
D. vessel's inclination from the vertical

95 1261 Ref: Compass, Adjustment, Flinders Bar
The vertical component of the Earth's magnetic field causes induced magnetism in vertical soft iron. This changes with latitude. What corrects for this coefficient of the deviation?
A. The Flinders bar
B. The heeling magnet
C. Quadrantal soft iron spheres
D. Bar magnets in the binnacle
Which statement about the Flinders bar of the magnetic compass is CORRECT?
A. It compensates for the error caused by the vertical component of the Earth's magnetic field.
B. It compensates for error caused by the heeling of a vessel.
C. It compensates for quadrantal deviation.
D. It is only needed in equatorial waters.

Magnets are placed in horizontal trays in the compass binnacle to compensate for the __________.
A. induced magnetism in the vessel's horizontal soft iron
B. change in the magnetic field when the vessel inclines from vertical
C. permanent magnetism of the vessel
D. magnetic fields caused by electrical currents in the vicinity

A single vertical magnet placed underneath the compass in the binnacle is used to compensate for __________.
A. the horizontal component of the permanent magnetism
B. deviation caused by the vessel's inclination from the vertical
C. induced magnetism in the horizontal soft iron
D. induced magnetism in the vertical soft iron

Heeling error is defined as the change of deviation for a heel of __________.
A. 2° while the vessel is on an intercardinal heading
B. 1° while the vessel is on a compass heading of 000°
C. 2° and is constant on all headings
D. 1° while the vessel is on a compass heading of 180°

What are the only magnetic compass correctors that correct for both permanent and induced effects of magnetism?
A. Quadrantal spheres
B. Heeling magnets
C. Athwartships magnets
D. Fore-and-aft magnets

When crossing the magnetic equator the __________.
A. Flinders bar should be inverted
B. heeling magnet should be inverted
C. the quadrantal spheres should be rotated 180°
D. Flinders bar should be moved to the opposite side of the binnacle

Which compensates for errors introduced when the vessel heels over?
A. The soft iron spheres on the arms of the binnacle
B. Magnets placed in trays inside the binnacle
C. A single vertical magnet beneath the compass
D. The Flinders bar
103  664  Ref: Compass, Adjustment, Permanent Magnets  
Magnets in the binnacles of magnetic compasses are used to reduce the effect of _________.
A. deviation  
B. variation  
C. local attraction  
D. All of the above

104  414  Ref: Compass, Adjustment, Quadrantal Spheres  
Deviation which is maximum on intercardinal compass headings may be removed by the _________.
A. Flinders bar  
B. transverse magnets  
C. fore-and-aft magnets  
D. soft iron spheres on the sides of the compass

105  755  Ref: Compass, Adjustment, Quadrantal Spheres  
Quadrantal error in a gyrocompass has its GREATEST effect _________.
A. in high latitudes  
B. near the equator  
C. on north or south headings  
D. on intercardinal headings

106  1164  Ref: Compass, Adjustment, Quadrantal Spheres  
The purpose of the soft iron spheres mounted on arms on the binnacle is to compensate for _________.
A. the vertical component of the permanent magnetism of the vessel  
B. the residual deviation  
C. magnetic fields caused by electrical currents in the vicinity  
D. induced magnetism in the horizontal soft iron

107  1165  Ref: Compass, Adjustment, Quadrantal Spheres  
The quadrantal spheres are used to _________.
A. remove deviation on the intercardinal headings  
B. remove deviation on the cardinal compass headings  
C. remove heeling error  
D. compensate for induced magnetism in vertical soft iron

108  1667  Ref: Compass, Adjustment, Quadrantal Spheres  
Which compensates for induced magnetism in the horizontal soft iron of a vessel?
A. Iron spheres mounted on the binnacle  
B. A single vertical magnet under the compass  
C. The Flinders bar  
D. Magnets in trays inside the binnacle

109  345  Ref: Compass, Adjustment, Soft Iron  
Before a magnetic compass is adjusted certain correctors must be checked to ensure that they are free of permanent magnetism. These correctors are the _________.
A. fore-and-aft and athwartships magnets  
B. dip needle and heeling magnet  
C. heeling magnet and Flinders bar  
D. Flinders bar and quadrantal spheres