
Q213 - Navigation Problems: Chart Plot

1. The following questions are based on Chart 12221TR, Chesapeake Bay Entrance, and the supporting publications. The draft of your vessel is 9.0 feet (2.75 meters) Gyro error is 2°W Variation is 10°W "Per standard magnetic compass" is abbreviated "psc" “Per gyrocompass” is abbreviated “pgc”
DEVIATION TABLE Magnetic Heading Deviation 000° 1.5°E 030° 2.0°E 060° 1.0°E 090° 0° 120° 1.0°W 150° 1.5°W 180° 2.5°W 210° 1.5°W 240° 1.0°W 270° 0.5°W 300° 0° 330° 0.5°E On 31 July, you are anchored at LAT 37°22.4'N, LONG 75°39.9'W You get underway at 0240 enroute to Yorktown, VA What is the course psc from the anchorage to point A located 0.5 mile east of Cape Charles Lighted Bell Buoy 14?

- **194°psc**
- 190°psc
- 180°psc
- 187°psc

Note:
The correct course is 194psc. This is determined by converting the charted true course of 206 using a 10W variation and a 2W deviation, resulting in a standard magnetic compass course of 194psc.

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2. Which of the following describes the coast between Great Machipongo Inlet and Cape Charles?

- marked by prominent, isolated, barren hills
- broken by the mouths of several major rivers
- **low, with sandy beaches bordered by marsh and woodlands**
- composed of high, rocky bluffs and wooded uplands

Note:
The coast between Great Machipongo Inlet and Cape Charles is low-lying, characterized by sandy beaches bordered by marsh and woodlands.

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3. If your engines turn for 6.5 knots, and you encounter a 0.5 knot southerly current, what is your ETA at point A?

- 0511
- 0400
- 0501
- **0450**

Note:
The southerly current reduces speed over ground from 6.5 knots to 6.0 knots. Calculating the travel time using this reduced speed and the charted distance results in an ETA of 0450.

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4. What is the course to steer per gyrocompass from the anchorage to point "A" if easterly winds are causing 3° of leeway?

- 189°pgc
- 185°pgc
- 178°pgc
- **181°pgc**

Note:
The correct course to steer per gyrocompass is 181pgc. Leeway, caused by easterly winds, necessitates a course adjustment; adding the 3 leeway to the uncorrected course of 178pgc yields 181pgc.

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5. At 0250, Great Machipongo Inlet Light "5" (37°21.8'N, 75°43.7'W) bears 279°pgc. At 0320, the light bears 320° pgc. If you are making good 6.5 knots, what is the position of your 0320-running fix?

- LAT 37°18.10'N, LONG 75°39.30'W
- **LAT 37°18.10'N, LONG 75°39.55'W**
- LAT 37°18.00'N, LONG 75°39.75'W
- LAT 37°17.95'N, LONG 75°39.95'W

Note:
The running fix is determined by advancing the earlier line of position by the distance run between observations and intersecting it with the later line of position. The distance run is calculated by multiplying speed by time, resulting in 3.25 nautical miles. Plotting the advanced 0250 line of position and the 0320 line of position yields a fix at LAT 3718.10'N, LONG 7539.55'W.

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6. At 0400, you obtain the following information: Sand Shoal Inlet South Light bearing 303° true at 7.1nm What is your 0400 position?

- LAT 37°14.2'N, LONG 75°40.7'W
- **LAT 37°14.0'N, LONG 75°40.7'W**
- LAT 37°14.1'N, LONG 75°41.3'W
- LAT 37°14.1'N, LONG 75°40.5'W

Note:
The correct position is determined by plotting a line from Sand Shoal Inlet South Light on the reciprocal bearing of 123 true and measuring 7.1 nautical miles along that line; only option B satisfies both the bearing and distance requirements.

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7. The visibility is about 5 miles. Which statement about Cape Charles Light is TRUE?

- **The light was visible at about 0400.**
- The light will not be visible until you enter the inbound leg of the traffic separation scheme.
- You will not see the light until you are within 5 miles of the light.
- The light has been visible since you departed the anchorage.

Note:
The light became visible at approximately 0400 because at that time, the vessel's distance from Cape Charles Light fell within the light's effective range given the 5-mile visibility. The light's effective range is determined by the lesser of its geographic and luminous range, and a powerful seacoast light can be visible beyond the general meteorological visibility. Therefore, the light's visibility is not limited to 5 miles, nor is it dependent on entering the traffic separation scheme or departing the anchorage.

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8. Which statement about your 0400 position is TRUE?

- The ocean floor is composed of shale.
- Anchoring, trawling and fishing are prohibited.
- You are governed by the Inland Rules of the Road.
- **You are within the territorial sea and contiguous zone.**

Note:
The charted position lies within the territorial sea and contiguous zone, as defined by U.S. law extending 24 nautical miles from the baseline.

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9. At 0405, you increase speed. At 0500, your position is LAT 37°06.0'N, LONG 75°41.1'W. What is the approximate depth of the water under the keel?

- 54 feet (16.4 meters)
- 66 feet (20.0 meters)
- 62 feet (18.8 meters)
- **46 feet (13.9 meters)**

Note:
The depth under the keel is calculated by adding the charted depth and the interpolated tidal height at the vessel's position and time, then subtracting the vessel's draft, resulting in approximately 46 feet (13.9 meters).

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10. At 0600, you are entering the inbound leg of the traffic separation scheme at position LAT 36°59.2'N, LONG 75°47.6' W. Course is 250°T. At 0605, Cape Henry Light bears 249°T At 0610, Cape Henry Light bears 248°T At 0625, Cape Henry Light bears 247°T Based on this, you know you are _____.

- meeting a current from dead ahead
- being set to the south
- running with a current from dead ahead
- **being set to the north**

Note:
The decreasing bearing of Cape Henry Light while maintaining a constant course indicates that the vessel is being set to the north, as the light is drawing farther to port, implying a northward displacement of the track over ground.
