
Q193 - Navigation Problems: Near Coastal

1. You are on course 079°T, speed 11.2 knots. At 0904 you see a daymark bearing 078°T at a range of 4.6. If you change course at 0910 to leave the daymark abeam to starboard at 0.5 mile, at what time will the daymark be abeam?

- **0928**
- 0935
- 0918
- 0923

Note:
The daymark will be abeam at 0928. After changing course, the distance to the abeam point is approximately 3.44 NM, which requires about 18.5 minutes at 11.2 knots.

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2. While on a course of 138°T, a light bears 14° on the starboard bow at a distance of 8.6 miles. What course should you steer to pass 3 miles abeam of the light leaving it to starboard?

- 138°T
- 135°T
- 141°T
- **132°T**

Note:
To pass 3 nautical miles abeam of a light, steer a course that creates a tangent line to a circle with a 3-mile radius centered on the light, ensuring the light remains on your starboard side. The correct course is 132T, calculated by determining the angle using trigonometry (sin θ = distance off / range) and adjusting the original course to achieve the desired tangent.

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3. While on a course of 159°T, a light bears 11° on the starboard bow at a distance of 10.6 miles. What course should you steer to pass 2 miles abeam of the light leaving it to starboard?

- **159°T**
- 171°T
- 163°T
- 167°T

Note:
The current course results in a closest approach of approximately 2 nautical miles to starboard of the light, fulfilling the requirement to pass 2 miles abeam while leaving the light to starboard; therefore, no course alteration is necessary.

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4. You are on course 251°pgc and 241° per magnetic compass, when you observe a range in line bearing 192°pgc. The chart indicates that the range is in line on a bearing of 194°T. The variation is 16°E. What is the deviation of the magnetic compass?

- 2°E
- 2°W
- **4°W**
- 10°W

Note:
The deviation is 4W because the compass heading is 4 more westerly than the vessel's magnetic heading after accounting for gyro error and variation.

5. You desire to make good a true course of 203°. The variation is 19°E, magnetic compass deviation is 2°W, and gyrocompass error is 1°E. A westerly wind produces a 3° leeway. What is the course to steer per standard magnetic compass to make the true course good?

- 223°psc
- 210°psc
- 183°psc
- **189°psc**

Note:
To make good a true course of 203, correct for leeway (3), then convert true to magnetic and magnetic to compass, accounting for variation (19E) and deviation (2W). This results in a course to steer of 189 per standard magnetic compass.

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6. The moon is full and at perigee on 20 January 1983. What is the maximum current you could expect at 2350 (ZD +5) at Nantucket Shoals?

- 0.5 knot
- 0.7 knot
- 0.8 knot
- **1.0 knot**

Note:
The 1983 Tidal Current Tables indicate a maximum current of 1.0 knot at Nantucket Shoals on January 20, 1983, at 2350 (ZD +5) due to full moon and perigee conditions, which produce perigean spring tides.

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7. The predicted time that the flood begins at the entrance to Delaware Bay is 1526. You are anchored off Chestnut St. in Philadelphia. If you get underway bound for sea at 1430 and turn for 11 knots, at what point will you lose the ebb current?

- New Castle
- **Liston Pt.**
- Arnold Pt.
- Ship John Shoal Lt.

Note:
You lose the ebb current at Liston Point because your estimated time of arrival there, traveling at 11 knots, aligns with the local time the current transitions from ebb to flood, as determined by the Tidal Current Tables.

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8. You are steaming on a course of 246°T at 17 knots. At 2107 you observe a lighthouse bearing 207°T. At 2119 the lighthouse bears 179°T. What is your distance off at the second bearing?

- **4.6 miles**
- 4.2 miles
- 3.9 miles
- 5.1 miles

Note:
The distance off at the second bearing is 4.6 nautical miles. This was determined by calculating the triangle formed by the ship's positions and the lighthouse, using the law of sines with a run of 3.4 NM and an angle of 28 at the lighthouse.

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9. You are steaming on a course of 198°T at 18.5 knots. At 0316 you observe a lighthouse bearing 235°T. At 0348 the lighthouse bears 259°T. What is your distance off at the second bearing?

- 16.3 miles
- 15.8 miles
- **14.8 miles**
- 15.3 miles

Note:
Applying the law of sines to the triangle formed by the two bearings and the distance traveled between them yields a distance of approximately 14.8 nautical miles from the lighthouse at the second bearing.

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10. You are underway on course 241°T at a speed of 18.2 knots. You sight a daymark bearing 241°T at a radar range of 3.9 miles at 1006. If you change course at 1009, what is the course to steer to leave the daymark abeam to starboard at 1.0 mile?

- 260°T
- 218°T
- **222°T**
- 257°T

Note:
To achieve a 1.0 NM starboard abeam passing distance from a daymark initially at 3.0 NM range on 241T, a course alteration of 19.5 to port is required, resulting in a new course of 222T.
