
Q127 - Navigation Problems: Oceans

1. You desire to make good a true course of 132°. The variation is 10°W, magnetic compass deviation is 5°E, and gyrocompass error is 5°W. A northeast by east wind produces a 5° leeway. What is the course to steer per standard magnetic compass to make the true course good?

- 135°psc
- **132°psc**
- 137°psc
- 142°psc

Note:
To achieve a true course of 132, correct for leeway, then apply variation (add West) and deviation (subtract East) to determine the standard magnetic compass course, resulting in 132psc.

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2. 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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3. A great circle crosses the equator at 141°E. It will also cross the equator at what other longitude?

- **39°W**
- 141°W
- 41°E
- 180°E

Note:
A great circle crossing the equator at 141E will also cross it at 39W, as great circles intersect the equator 180 apart.

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4. A great circle will intersect the equator at how many degrees of longitude apart?

- 90°
- **180°**
- 45°
- 0°

Note:
A great circle intersects the equator at two points 180 of longitude apart. Great circles, excluding the equator, bisect the Earth, resulting in diametrically opposite intersections along the equator, which are always separated by 180 of longitude.

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5. For navigational purposes, each great circle on the Earth has a length of _____.

- 3,600 miles
- 5,400 miles
- 12,500 miles
- **21,600 miles**

Note:
A great circle on Earth measures 21,600 nautical miles, calculated as 360 degrees multiplied by 60 nautical miles per degree.

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6. The true course from point A to point B is 317°. A SSW wind causes a 4° leeway, variation is 6°W and deviation is 1°E. What is the magnetic compass course to steer to make good the true course?

- 308°psc
- 313°psc
- 326°psc
- **318°psc**

Note:
To make good a true course of 317, steer 313 true to account for 4 of leeway due to the wind. Then, apply a variation of 6W and a deviation of 1E, resulting in a magnetic compass course to steer of 318psc.

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7. The upper vertex of a great circle track is in LONG 156°00'E. Sailing eastward, the great circle track will cross the equator in which LONG?

- 66°00'E
- 110°00'W
- **114°00'W**
- 66°00'W

Note:
The vertex of the great circle track is at 156E. Sailing eastward, the track crosses the equator 90 of longitude away, resulting in a crossing at 114W (156E + 90 = 246E, which is 114W).

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8. Your vessel is steering course 027° per standard magnetic compass (psc), variation for the area is 19°W, and deviation is 2°E. The wind is from the north-northwest, producing a 5° leeway. What true course are you making good?

- **015°T**
- 049°T
- 044°T
- 005°T

Note:
The correct true course made good is 015T, calculated by first converting the compass course to true, accounting for variation and deviation, and then adding the 5 leeway caused by the wind from north-northwest on the port bow.

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9. Your 0000 zone time position on 13 June is LAT 24° 35' N, LONG 142° 26' E. Your vessel is on course 245° T, speed is 13.5 knots. What is the zone time of sunrise?

- Time 0440
- **Time 0445**
- Time 0503
- Time 0528

Note:
After converting the Nautical Almanac's sunrise time to zone time using the ship's longitude and zone description, the correct sunrise time is 0445 ZT.

10. At 0100 zone time on 23 September your DR position is LAT 24°25.0'N, LONG 83°00.0'W. You are steering course 315°T. The speed over the ground is 10.0 knots. You observed 3 morning sun lines. Determine the latitude and longitude of your 1100 running fix. ZONE OBSERVED TIME GHA ALTITUDE(Ho) DECLINATION ---- --- ---------- ---------- 0700 17°20.1' 21°09.0' S 00°09.7' 0900 47°03.0' 46°05.0' S 00°11.6' 1100 77°06.4' 63°16.1' S 00°13.5'

- **LAT 25°35.3'N, LONG 84°17.0'W**
- LAT 25°42.6'N, LONG 84°18.7'W
- LAT 25°30.4'N, LONG 84°28.6'W
- LAT 25°28.3'N, LONG 84°34.3'W

Note:
The correct answer is LAT 2535.3'N, LONG 8417.0'W. This position results from advancing the DR and plotting the intersection of the three morning Sun LOPs to 1100.