
Q186 - Navigation Problems: Oceans

1. On 1 December your 1600 ZT DR position is LAT 22°48.0'S, LONG 91°26.0'E. You are on course 327°T at a speed of 16 knots. What will be the zone time of sunset at your vessel?

- 1823
- **1827**
- 1831
- 1847

Note:
Determine the zone time of sunset by obtaining the local mean time of sunset from the Nautical Almanac for the given latitude, then applying the longitude and time zone correction.

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2. On 1 November your 1600 zone time DR position is LAT 27°48'S, LONG 91°26'E. Your vessel is on a course of 327°T at a speed of 16 knots. What will be the zone time of sunset at your vessel?

- **1813**
- 1821
- 1829
- 1836

Note:
The Nautical Almanac provides the Local Mean Time (LMT) of sunset for a given date and latitude. Convert this LMT to Zone Time by subtracting the longitude in time, accounting for the vessel's position (9126'E) and time zone (+6), resulting in a Zone Time of 1813.

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3. On 1 September your 1115 zone time DR position is LAT 25°20.0'N, LONG 28°24.0'W. At that time, you observe the Sun bearing 160.5°psc. The chronometer reads 01h 14m 58s, and the chronometer error is 01m 17s fast. The variation is 13.5°W. What is the deviation of the standard compass?

- **2.1°E**
- 4.1°E
- 11.0°W
- 11.0°E

Note:
The deviation is 2.1E, calculated by subtracting the variation and compass bearing from the true bearing obtained through sight reduction.

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4. On 10 August your 0430 ZT position is LAT 29°56.7'S, LONG 139°11.0'E. Your course is 321°T, speed 18.2 knots. You observed 3 celestial bodies. Determine the latitude and longitude of your 0500 running fix.

- LAT 29°46.0'S, LONG 138°54.0'E
- **LAT 29°49.2'S, LONG 138°57.0'E**
- LAT 29°56.0'S, LONG 139°03.8'E
- LAT 30°07.5'S, LONG 138°55.2'E

Note:
Choice B is correct; it aligns with the 30-minute run at 18.2 knots on a course of 321T and the expected direction (northwest) from the initial position when considering celestial lines of position.

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5. On 11 May your vessel's 1839 ZT position is LAT 17°30'N, LONG 63°55'W, when an amplitude of the Sun's center is observed on the celestial horizon bearing 301° per standard magnetic compass. Variation for this area is 10.5°W. The chronometer reads 10h 37m 10s and is 02m 08s slow. What is the deviation of the compass?

- 2.5°W
- 2.0°W
- **1.5°W**
- 2.0°E

Note:
The compass deviation is 1.5W, calculated by comparing the true azimuth (289T) derived from the amplitude with the observed 301 compass bearing and the 10.5W variation.

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6. On 13 August your 0345 ZT DR position is LAT 21°35.0'N, LONG 135°26.0'W. You are on course 052°T at a speed of 14 knots. What will be the zone time of sunrise at your vessel?

- 0443
- 0449
- **0536**
- 0540

Note:
Sunrise time is determined by finding the local mean time of sunrise from the Nautical Almanac for the vessel's latitude, then converting to zone time using longitude and the zone description. The correct answer, calculated using these steps, is 0536 zone time.

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7. On 13 September your 1830 ZT DR position was LAT 23°03'S, LONG 105°16'E when you observed a faint unidentifiable star through a hole in the clouds. The star bore 265.0°T at a sextant altitude (hs) of 62°25.4'. The chronometer read 11h 24m 39s and is 5m 08s slow. The index error is 1.0' off the arc, and the height of eye is 52 feet. What star did you observe?

- Sigma Ophiuchi
- Alcyone
- **Dschubba**
- Gamma Lupi

Note:
The observed star was identified by reducing the sight for the correct time and position, resulting in a computed altitude and azimuth that matched Dschubba's values, unlike the other candidates.

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8. On 15 July at 0447 ZT, your vessel's DR position is LAT 22°42' N, LONG 126°36' E. At approximately this time, you obtain a sextant altitude (hs) of Polaris reading 23°46.2' with an index error of 1.6' off the arc. Your chronometer reads 08h 48m 28s, and is 1m 16s fast. What is your latitude by Polaris, given a height of eye of 33 feet?

- 22°44.1'N
- 22°46.2'N
- 22°50.2'N
- **22°54.1'N**

Note:
The correct latitude is determined by correcting the sextant altitude of Polaris for index error, dip, refraction, and then applying a tabular correction based on date, assumed latitude, and local hour angle, resulting in 2254.1'N.

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9. On 15 July your vessel is enroute from Portland, OR, to Singapore, Malaysia. You are steering course 243°T and making a speed of 16 knots. Your 1845 zone time DR is LAT 27°42.0'N, LONG 167°02.0'E. You observed 3 celestial bodies. Determine the latitude and longitude of your 1945 running fix.

- **LAT 27°31.1'N, LONG 166°43.0'E**
- LAT 27°38.5'N, LONG 166°45.1'E
- LAT 27°45.3'N, LONG 166°32.2'E
- LAT 28°18.1'N, LONG 166°39.8'E

Note:
The correct running fix is determined by advancing the DR and plotting the intersection of three celestial lines of position (LOPs) at 1945, resulting in a position of 2731.1' N, 16643.0' E. This position aligns with the ship's course and distance run, and is consistent with the expected latitude decrease due to the southwesterly heading.

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10. On 15 November your 0813 zone time (ZT) fix gives you a position of LAT 22°30.0'N, LONG 67°28.0'W. Your vessel is on course 164°T, and your speed is 13.5 knots. Local apparent noon (LAN) occurs at 1215 ZT, at which time a meridian altitude of the Sun's lower limb is observed. The observed altitude (Ho) for this sight is 49°46.0'. What is the latitude at 1200 ZT?

- **21°42.5'N**
- 21°39.3'N
- 21°36.0'N
- 21°32.8'N

Note:
The latitude at 1200 ZT is determined by calculating the latitude at local apparent noon (LAN) and then adjusting for the vessel's southward movement during the 15 minutes preceding noon.
