Set your starwheel to August 20 at 10:00 PM. Ignore daylight saving time. Assume you can see stars in daylight.

1. The constellation located closest to the southeast horizon is:
(A) Antila.
(B) Columba.
(C) Scorpius.
(D) Piscis Austrinus.
(E) (Unsure/guessing/lost/help!)

2. This constellation (which was close to the southeast horizon at 10:00 PM) completely sets below the horizon __________ later.
(A) four hours.
(B) six hours.
(C) eight hours.
(D) (Unsure/guessing/lost/help!)

3. This constellation (which was close to the southeast horizon at 10:00 PM) will set on the __________ horizon.
(A) southwest.
(B) west.
(C) northwest.
(D) (Unsure/guessing/lost/help!)

Set your starwheel to January 25 at 11:00 PM. Assume you can see stars in daylight.

4. The constellation located closest to the northeast horizon is:
(A) Boötes.
(B) Perseus.
(C) Lacerta.
(D) Ursa Major.
(E) (Unsure/guessing/lost/help!)

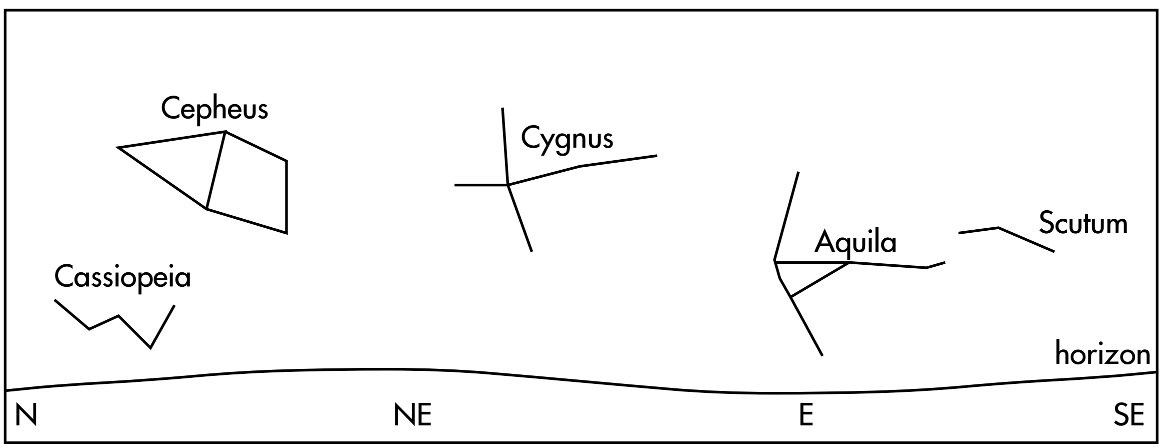
5. This constellation (which was close to the northeast horizon at 11:00 PM) completely sets below the horizon __________ later.
(A) seven hours.
(B) 12 hours.
(C) 17 hours.
(D) (Unsure/guessing/lost/help!)

6. This constellation (which was close to the northeast horizon at 11:00 PM) will set on the __________ horizon.
(A) southwest.
(B) west.
(C) northwest.
(D) (Unsure/guessing/lost/help!)

7. As seen from San Luis Obispo, CA, constellations move around the celestial north pole (located near Polaris) in __________ circles.
(A) clockwise.
(B) counterclockwise.
(C) (Both of the above choices.)
(D) (Unsure/guessing/lost/help!)

8. As seen from San Luis Obispo, CA, constellations above the southern horizon move across the sky making low __________ arcs.
(A) clockwise.
(B) counterclockwise.
(C) (Both of the above choices.)
(D) (Unsure/guessing/lost/help!)

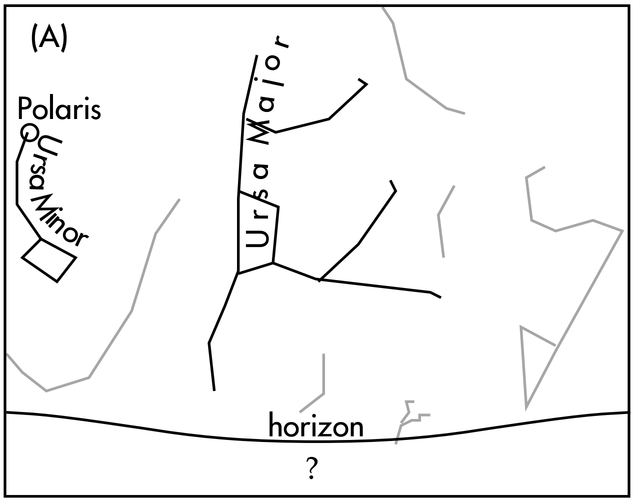
The diagram below shows the northeast horizon, as seen by an observer at 10:00 PM in San Luis Obispo, CA. Ignore daylight saving time.

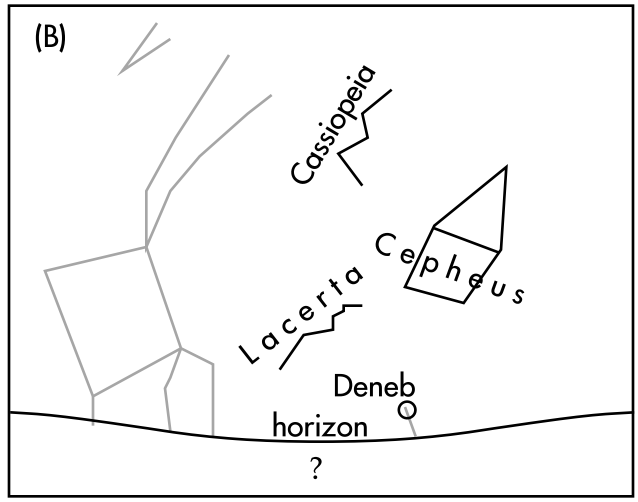


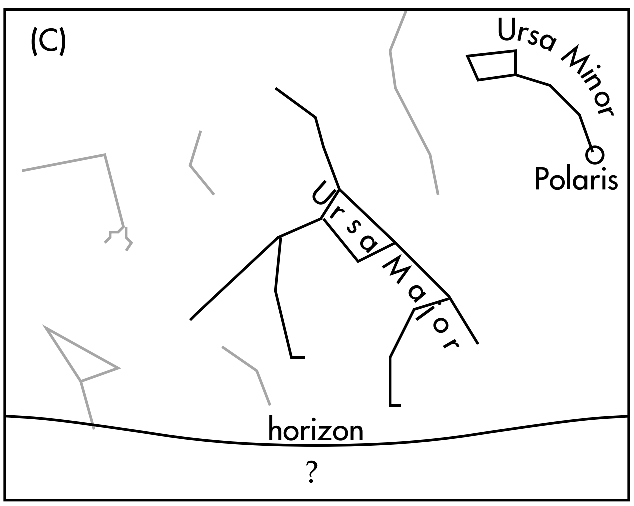
9. What date is this?
(A) March 30.
(B) May 30.
(C) September 30.
(D) November 30.
(E) (Unsure/guessing/lost/help!)

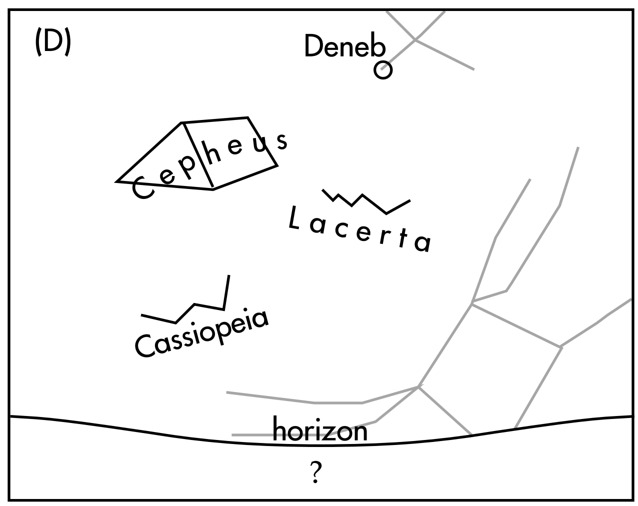
10. Within the next 24 hours, __________ will eventually be at the *zenith* (directly overhead).
(A) Cassiopeia.
(B) Cepheus.
(C) Cygnus.
(D) Aquila.
(E) Scutum.
(F) (Unsure/guessing/lost/help!)

11. The diagrams (A)-(D) below show positions of constellations and stars near the horizon. According to your starwheel, which diagram corresponds to the *northwest* horizon at 7:00 PM on August 20, for an observer in San Luis Obispo, CA? Ignore daylight saving time. Assume you can see stars in daylight.



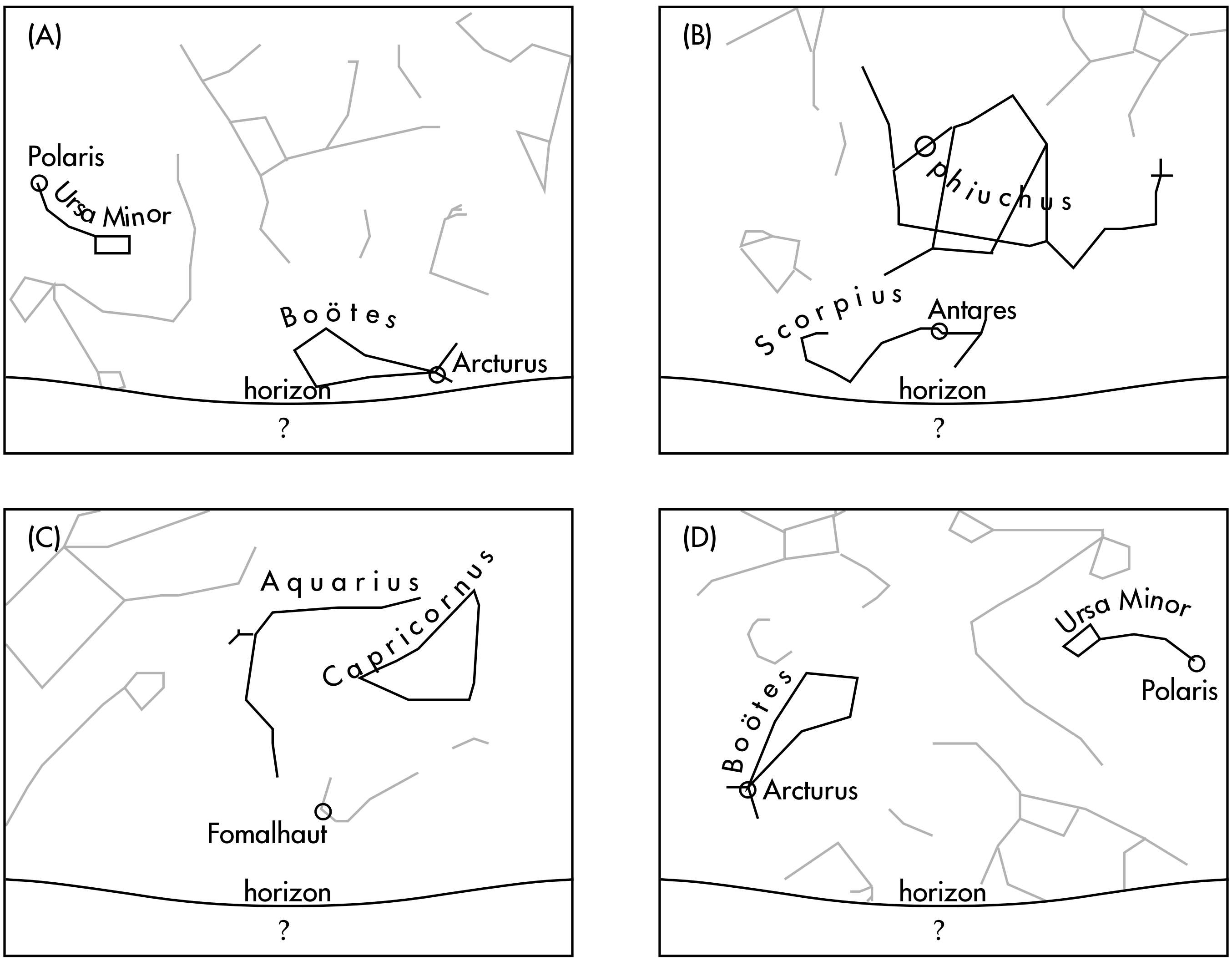






(E) (Unsure/guessing/lost/help!)

12. The diagrams (A)-(D) below show positions of constellations and stars near the horizon. According to your starwheel, which diagram corresponds to the *northwest* horizon at 6:30 PM on October 10, for an observer in San Luis Obispo, CA? Ignore daylight saving time. Assume you can see stars in daylight.



(E) (Unsure/guessing/lost/help!)

13. (If you can see stars in daylight), on September 1 the sun would be in front of the zodiac constellation:
(A) Leo.
(B) Virgo.
(C) Libra.
(D) Scorpius.
(E) (Unsure/guessing/lost/help!)

14. (If you can see stars in daylight) on October 1 the sun would be in front of the zodiac constellation:
(A) Leo.
(B) Virgo.
(C) Libra.
(D) Scorpius.
(E) (Unsure/guessing/lost/help!)

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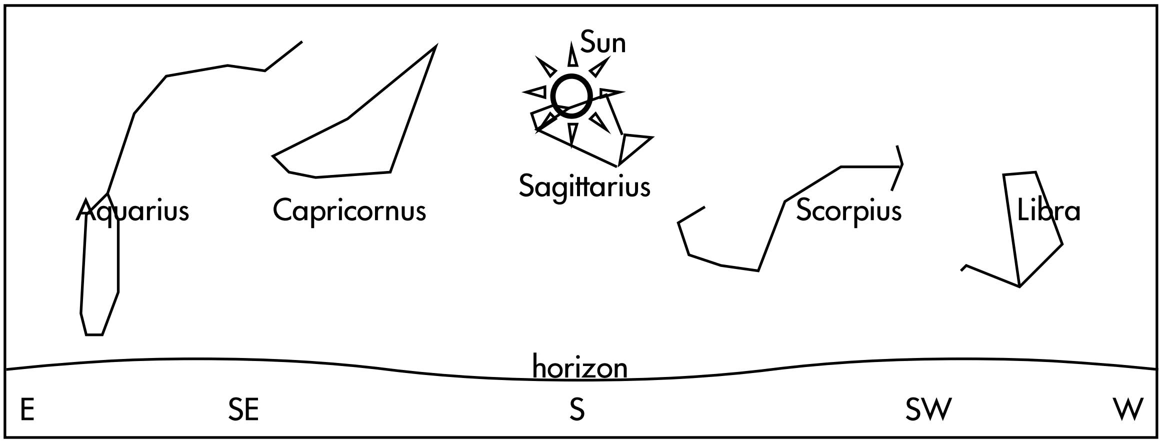
15. Earth's __________ causes the sun to appear in front of certain zodiac constellations at the same time each year, as seen by an observer in San Luis Obispo, CA.
(A) rotation.
(B) revolution.
(C) precession.
(D) tilt.
(E) (More than one of the above choices.)
(F) (Unsure/guessing/lost/help!)

16. Earth's __________ causes the discrepancy between astrological sun-sign dates and the dates when the sun is actually in front of certain zodiac constellations, as seen by an observer in San Luis Obispo, CA.
(A) rotation.
(B) revolution.
(C) precession.
(D) tilt.
(E) (More than one of the above choices.)
(F) (Unsure/guessing/lost/help!)

The diagram below shows the southern horizon, as seen by an observer at 12:00 PM (noon) in San Luis Obispo, CA. Ignore daylight saving time. Assume you can see the stars in daylight.



17. What date is this?
- (A) December 1.
- (B) January 1.
- (C) February 1.
- (D) March 1.
- (E) (Unsure/guessing/lost/help!)

18. The zodiac constellation highest overhead at 12:00 AM (midnight) on this date is:
- (A) Cancer.
- (B) Gemini.
- (C) Taurus.
- (D) Aries.
- (E) Pisces.
- (F) (Unsure/guessing/lost/help!)

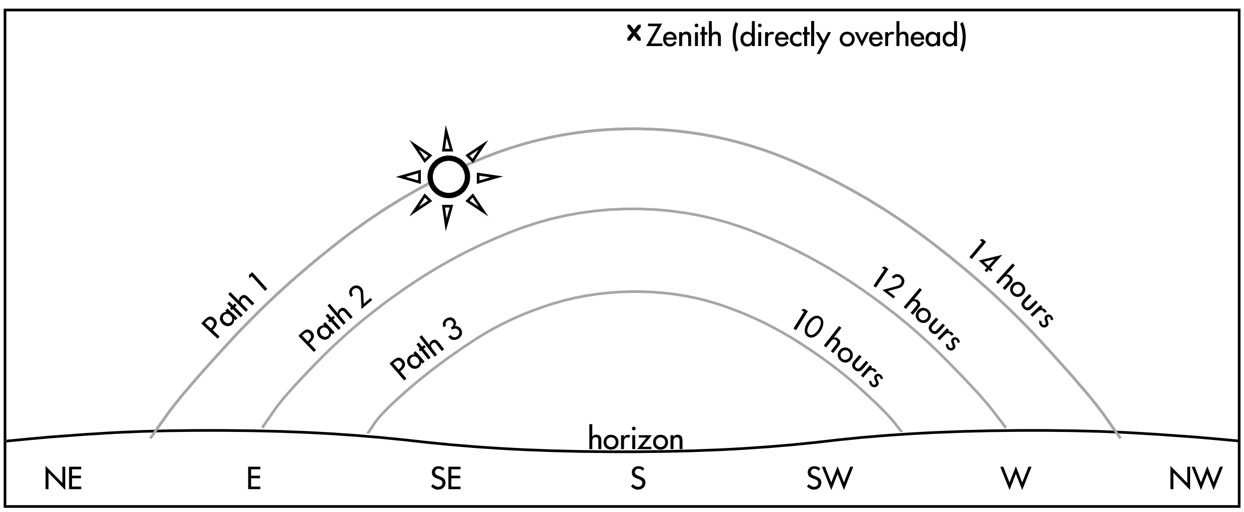
19. The zodiac constellation the sun would be located in, $\begin{bmatrix}\text{1 day}\\ \text{30 days}\\ \text{60 days}\end{bmatrix}$ $\begin{bmatrix}\text{previous to}\\ \text{after}\end{bmatrix}$ this date is:
- (A) Aquarius.
- (B) Capricornus.
- (C) Sagittarius.
- (D) Scorpius.
- (E) Libra.
- (F) (Unsure/guessing/lost/help!)

20. The sun is located on the ecliptic between the constellations $\begin{bmatrix}\text{Sagittarius and Scorpius}\\ \text{Gemini and Taurus}\end{bmatrix}$.

(According to your starwheel), there are approximately __________ between sunrise and sunset on that day.

(A) 10 hours.
(B) 12 hours.
(C) 14 hours.
(D) 24 hours.
(E) (Unsure/guessing/lost/help!)

The diagram below shows the sun's $\begin{bmatrix}\text{path 1}\\ \text{path 2}\\ \text{path 3}\end{bmatrix}$ across the sky on a certain day, as seen by an observer in San Luis Obispo, CA.



21. Which month(s) would the sun make $\begin{bmatrix}\text{path 1}\\ \text{path 2}\\ \text{path 3}\end{bmatrix}$ across the sky?

(A) March.
(B) June.
(C) September.
(D) December.
(E) (More than one of the above choices.)
(F) (Unsure/guessing/lost/help!)

An observer in San Luis Obispo, CA notices that there are approximately $\begin{bmatrix}10\\12\\14\end{bmatrix}$ hours between sunrise and sunset.

22. On this day, the sun $\begin{bmatrix}\text{rose}\\\text{will set}\end{bmatrix}$:

(A) between northeast and east.
(B) due east.
(C) between east and southeast.
(D) between southwest and west.
(E) due west.
(F) between west and northwest.
(G) (Unsure/guessing/lost/help!)

23. As soon as __________ after this date there will be approximately $\begin{bmatrix}10\\12\\14\end{bmatrix}$ hours between sunrise and sunset.

(A) one month.
(B) three months.
(C) six months.
(D) nine months.
(E) twelve months.
(F) (Unsure/guessing/lost/help!)

An observer in San Luis Obispo, CA notices the sun $\begin{bmatrix}\text{rising}\\ \text{setting}\end{bmatrix} \begin{bmatrix}\text{between northeast and east}\\ \text{due east}\\ \text{between east and southeast}\\ \text{between southwest and west}\\ \text{due west}\\ \text{between west and northwest}\end{bmatrix}$.

24. In which month(s) does this occur?
(A) March.
(B) June.
(C) September.
(D) December.
(E) (Two of the above choices.)
(F) (Unsure/guessing/lost/help!)

25. On this day, there are __________ between sunrise and sunset.
(A) 10 hours.
(B) 12 hours.
(C) 14 hours.
(D) 24 hours.
(E) (Unsure/guessing/lost/help!)

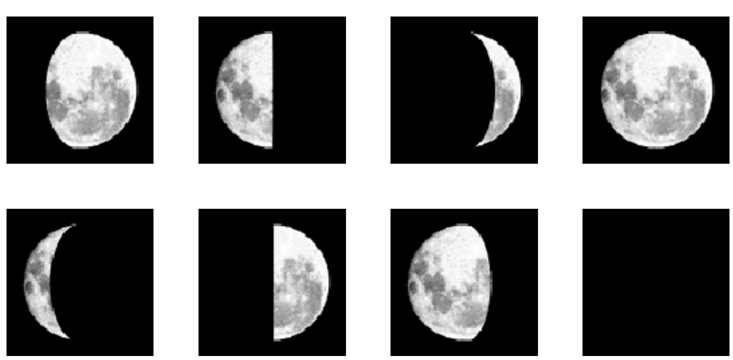
26. Approximately how many different moon phases can be observed over $\left[\begin{array}{l}\text{12 hours}\\ \text{24 hours}\\ \text{one week}\\ \text{two weeks}\end{array}\right]$?

(A) Only one.
(B) Two.
(C) Four.
(D) Eight (all of them).
(E) (Unsure/guessing/lost/help!)

27. Approximately how much time elapses between $\left[\begin{array}{l}\text{moonrise to moonset}\\ \text{consecutive moon phases}\\ \text{new moon to new moon}\end{array}\right]$?

(A) An hour.
(B) Several hours.
(C) 12 hours.
(D) 24 hours.
(E) Several days.
(F) One week.
(G) Several weeks.
(H) 28 days.

28. Which is the $\left|\begin{array}{l}\text{next phase}\\ \text{phase one week}\\ \text{phase two weeks}\\ \text{phase three weeks}\\ \text{phase four weeks}\end{array}\right|$ after the $\left|\begin{array}{l}\text{new}\\ \text{full}\\ \text{first quarter}\\ \text{third quarter}\\ \text{waxing crescent}\\ \text{waning crescent}\\ \text{waxing gibbous}\\ \text{waning gibbous}\end{array}\right|$ moon?



29. What time is it when the $\left[\begin{array}{l}\text{new}\\ \text{full}\\ \text{first quarter}\\ \text{third quarter}\\ \text{waxing crescent}\\ \text{waning crescent}\\ \text{waxing gibbous}\\ \text{waning gibbous}\end{array}\right]$ moon is $\left[\begin{array}{l}\text{rising}\\ \text{highest overhead}\\ \text{setting}\end{array}\right]$?

(A) 12:00 PM (noon).
(B) 3:00 PM (afternoon).
(C) 6:00 PM (sunset).
(D) 9:00 PM (evening).
(E) 12:00 AM (midnight).
(F) 3:00 AM (wee hours).
(G) 6:00 AM (sunrise).
(H) 9:00 AM (morning).

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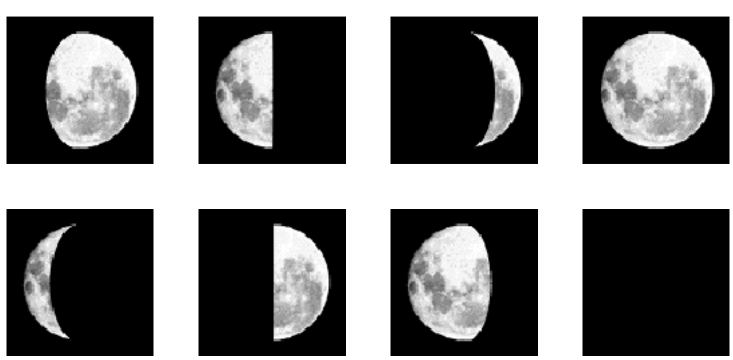
30. Which phase will the moon have when $\left[\begin{array}{l}\text{rising}\\ \text{highest overhead}\\ \text{setting}\end{array}\right]$ at $\left[\begin{array}{l}12:00\ \text{PM}\\ 3:00\ \text{PM}\\ 6:00\ \text{PM}\\ 9:00\ \text{PM}\\ 12:00\ \text{AM}\\ 3:00\ \text{AM}\\ 6:00\ \text{AM}\\ 9:00\ \text{AM}\end{array}\right]$?



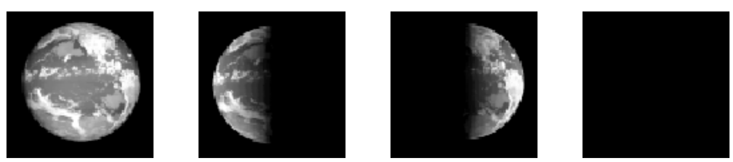
31. [The moon's rotation about its own axis / The moon's revolution around Earth / Earth blocking light from the sun, casting a shadow on the moon / The moon blocking light from the sun, casting a shadow on Earth / Earth's rotation about its own axis] causes:

- (A) the different phases of the moon.
- (B) the moon to rise and set.
- (C) lunar eclipses.
- (D) solar eclipses.
- (E) (None of the above choices.)
- (F) (Unsure/guessing/lost/help!)

32. Would it be possible to see the moon during the daytime (between sunrise and sunset)?

- (A) Yes, with any phase.
- (B) Yes, with any phase, except for new and full moons.
- (C) Yes, but only waxing crescent and waning crescent phases are possible.
- (D) No, it is impossible to see the moon during the daytime.
- (E) (Unsure/guessing/lost/help!)

33. While an observer in San Luis Obispo, CA, is looking at a full moon, which Earth phase would be seen by an observer on the side of the moon facing Earth?



(A) (B) (C) (D)

(E) (Unsure/guessing/lost/help!)