Name: KEY KEY KEY KEY KEY

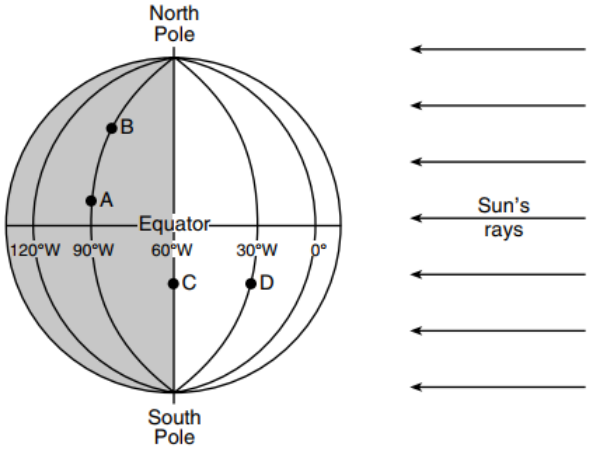
Astronomy Part II Review
Sun, Earth, Moon

1. A star's apparent movement through the night sky is caused by Earth's rotation. Identify the device that was used first to demonstrate that Earth rotates. Foucault Pendulum

2. The entire constellation of Orion is visible in the night sky in January to an observer in New York State. State why this constellation is ***not*** visible in the night sky to this observer in June?
The Earth is revolving around the Sun. This causes the night side of the Earth to face different constellations throughout the year.

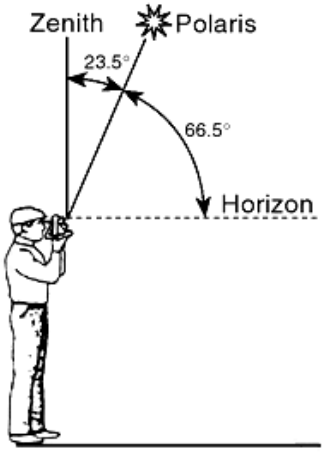
3. State the solar time at location D if the solar time at location C is 6:00 a.m. Indicate a.m. or p.m. in your answer.

8:00 am



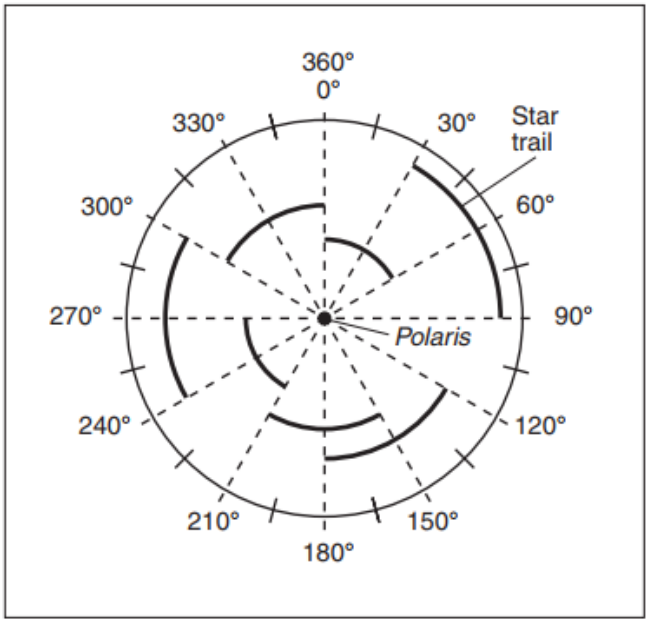
4. Time zones are based on Earth's rotation at rate of 15° per hour.
(rotation or revolution) (15° or 1°)

5. Using the diagram to the right, what is the latitude of the observer? 66.5°N



6. As latitude increases, what happens to the altitude of Polaris?
It also increases.

Base your answers to questions 7 and 8 on the diagram below and on your knowledge of Earth science. The diagram represents a time-exposure photograph taken by aiming a camera at Polaris in the night sky and leaving the shutter open for a period of time to record star trails. The angular arcs (star trails) show the apparent motions of some stars.



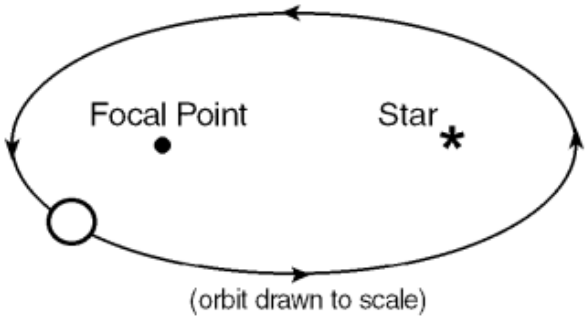
7. Identify the motion of Earth that causes these stars to appear to move in a circular path.

Earth's rotation

8. Determine the number of hours it took to record the star trails labeled on the diagram.

60° of rotation/15° per hour = 4 hours

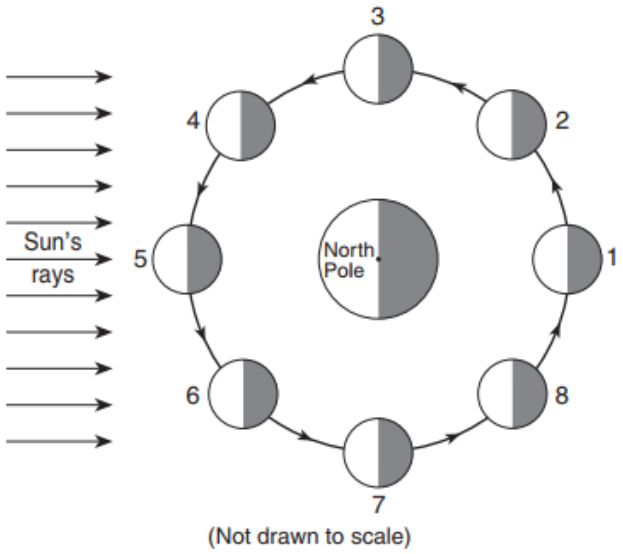
The diagram below represents the elliptical orbit of a planet traveling around a star. The center of the star and the focal point represent the foci of the orbit.



9. Calculate the eccentricity of the ellipse to the nearest thousandth.

eccentricity = $\frac{3.8\text{cm}}{7.5\text{cm}}$ = 0.5066666 = 0.507

Base your answers to questions 10 -13 on the diagram below, which represents eight positions of the Moon in its orbit around Earth.



10. Identify by number the Moon's positions where a lunar eclipse and solar might be observed from Earth.

Lunar Eclipse: 1 Solar Eclipse: 5

11. Why do we not see lunar and solar eclipses every month?

The Moon's orbit is inclined (tilted) about 5° from Earth's orbit.

12. Calculate the number of days from the Moon phase at position 1 to the Moon phase at position 5 as seen from Earth.

14.75 (14-15 days)

full phase cycle = 29.5 days
1/2 phase cycle = 14.75 days

13. The photographs below show the changing appearance of the Moon as viewed from New York State during three consecutive Moon phases. In the space below each photograph, identify the number of the Moon position that matches each of these phases.

Position: 2 → Position: 3 → Position: 4

waning gibbous → 3rd quarter → waning crescent

14. The same side of the Moon always faces Earth because the Moon's period of revolution
    a. is longer than the Moon's period of rotation
    b. equals the Moon's period of rotation
    c. is longer than Earth's period of rotation
    d. equals Earth's period of rotation

The table below shows tide data for a location on the north shore of Long Island, in New York State.

Day	Tide	Time
Tuesday	High Tide	12:11 a.m.
	Low Tide	6:23 a.m.
	High Tide	12:36 p.m.
	Low Tide	6:49 p.m.
Wednesday	High Tide	1:02 a.m.
	Low Tide	7:15 a.m.
	High Tide	1:27 p.m.

15. Based on these data, what is the most likely time of the next high tide?

Thursday at about 1:53am

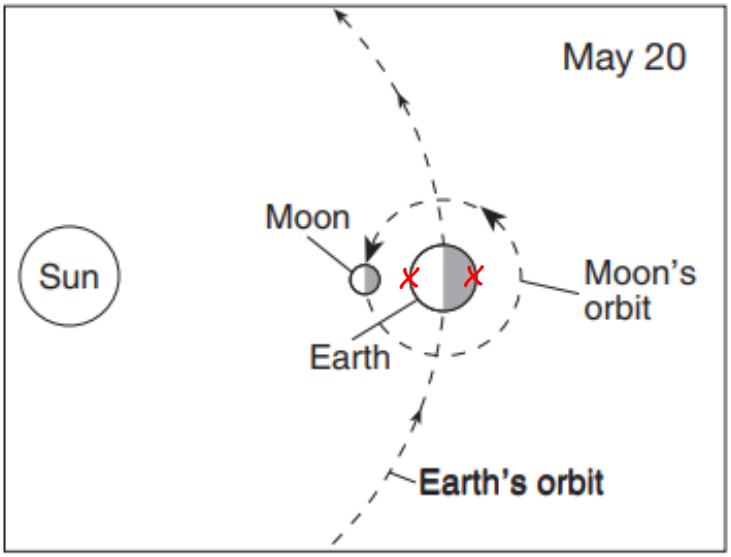
16. Why does the Moon's gravity have a greater effect on Earth's ocean tides than the Sun's gravity?
    a. The Sun is composed mostly of gases.
    b. The Sun's gravity influences more planets.
    c. The Moon has a greater mass.
    d. The Moon is much closer to Earth.

17. On the diagram, identify the two positions on Earth with an **X**, where the highest tides would occur.

High tides always line up with the Moon.

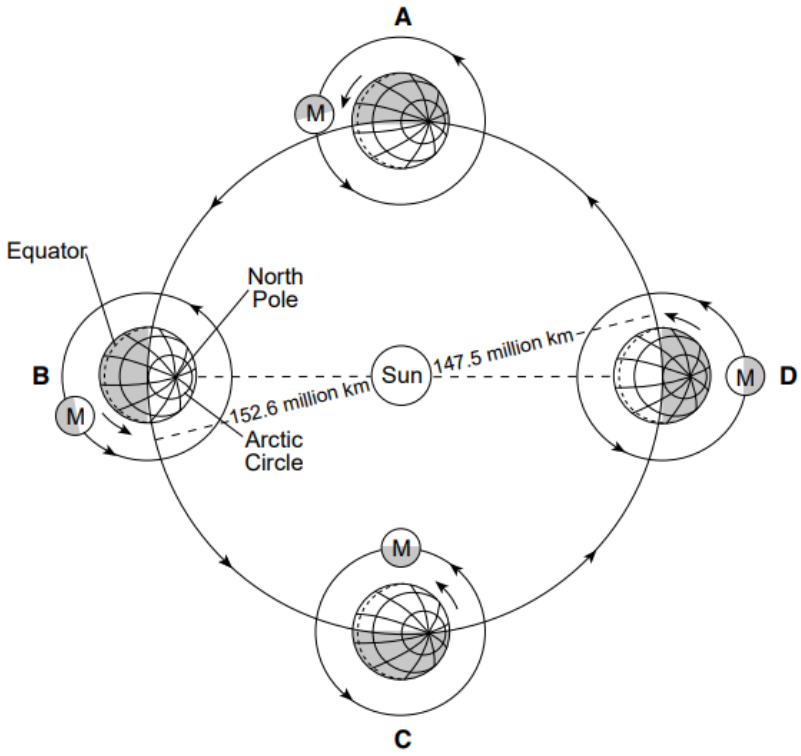
Low tides are perpendicular to the position of the Moon.

This is a "spring tide" Moon position when the Sun, Moon and Earth line up.



(Not drawn to scale)

Base your answers to questions 18 – 21 on the diagram below and on your knowledge of Earth science. The diagram represents Earth in its orbit around the Sun and the Moon (M) in different positions in its orbit around Earth. Letters A through D represent four positions of Earth in its orbit.



18. About how many degrees does the Earth move in its orbit around the Sun each day? 1°/day

19. Explain how the gravitational attraction between the Sun and the Earth changes as Earth moves from position B to D.
As the Earth moves from position B to D, the gravitational attraction INCREASES because the Earth is getting closer to the Sun.

20. Identify the lettered position where Earth's velocity around the Sun is the greatest.
D - because it's a labeled position that's closest to the Sun.

21. Which lettered position of the Earth has the Moon in the right position for a

    a. Lunar eclipse? D (full Moon phase)

    b. Solar eclipse? C (new Moon phase)