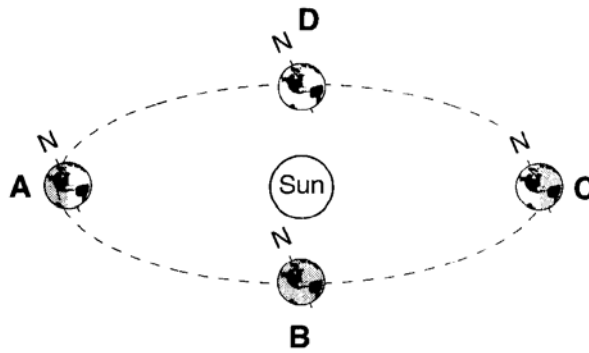


8. Base your answer to the following question on the diagram below, which represents Earth in its orbit around the Sun. The position of Earth on the first day of each season is labeled *A*, *B*, *C*, and *D*.

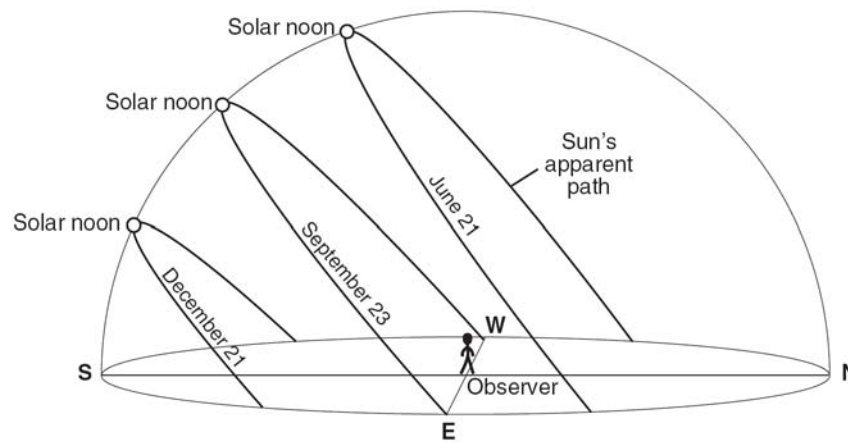


(Not drawn to scale)

Which event is caused by Earth's revolution?

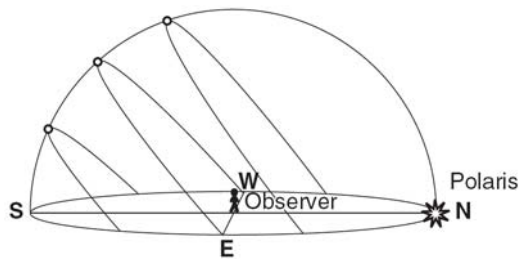
- 1) the apparent shift in the path of a Foucault pendulum
- 2) deflection of planetary winds to the right in the Northern Hemisphere
- 3) the apparent rising and setting of the Sun
- 4) different constellations observed in the night sky throughout the year

Base your answers to questions 9 and 10 on diagram below, which represents the Sun's apparent paths and the solar noon positions for an observer at 42° N latitude on December 21, September 23, and June 21.

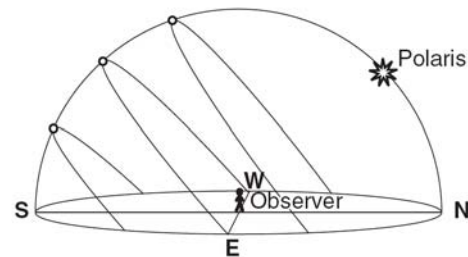


9. Which diagram best shows the location of *Polaris* relative to the observer?

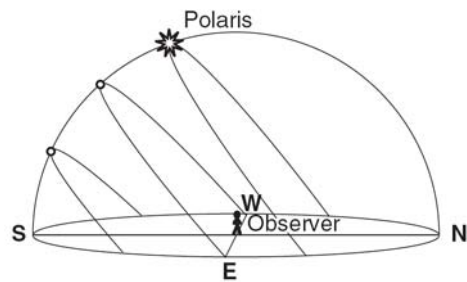
1)



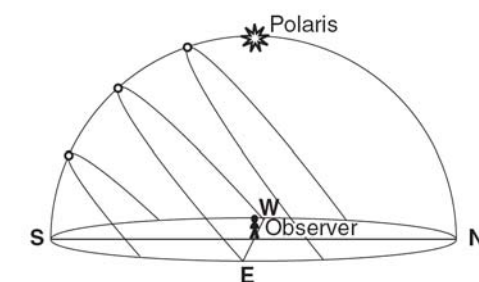
3)



2)



4)



10. How many hours occurred between sunrise and solar noon on September 23?

1) 6

2) 8

3) 12

4) 24

11. When observed from a location in Maine for one night, the North Star (*Polaris*) appears to

- 1) rise in the east and set in the west
- 2) rise in the west and set in the east
- 3) move southward along an arc-shaped path
- 4) remain stationary in the sky

12. Which statement best explains the apparent daily motion of the stars around *Polaris*?

- 1) The Earth's orbit is an ellipse.
- 2) The Earth has the shape of an oblate spheroid.
- 3) The Earth rotates on its axis.
- 4) The Earth revolves around the Sun.

13. Why do stars appear to move through the night sky at the rate of 15 degrees per hour?

- 1) The Earth actually moves around the Sun at a rate of 15° per hour.
- 2) The stars actually move around the center of the galaxy at a rate of 15° per hour.
- 3) The Earth actually rotates at a rate of 15° per hour.
- 4) The stars actually revolve around the Earth at a rate of 15° per hour.

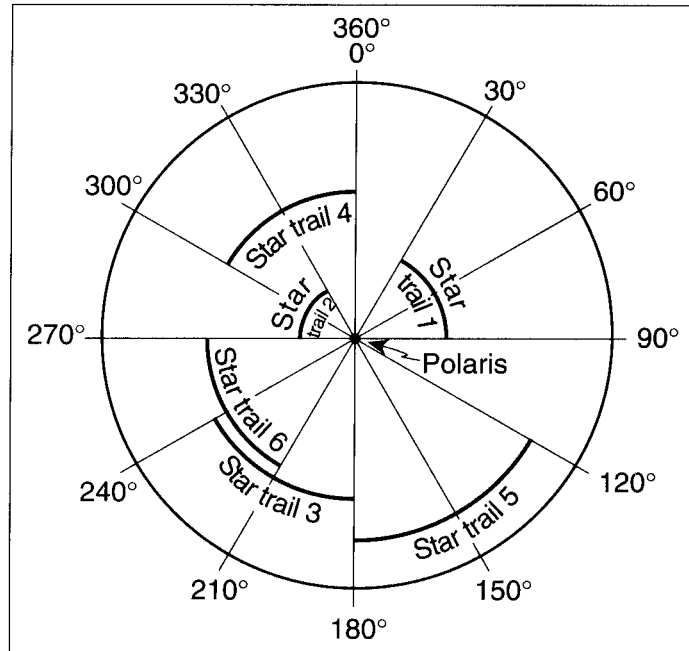
14. The Coriolis effect is a result of Earth's

- 1) tilted axis
- 2) orbital shape
- 3) revolution
- 4) rotation

15. Earth's rate of rotation is approximately

- 1) 1° per day
- 2) 15° per day
- 3) 180° per day
- 4) 360° per day

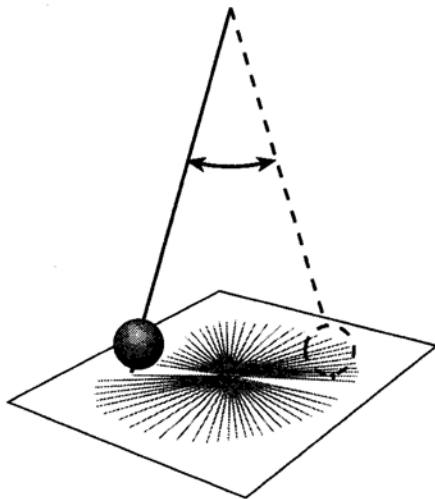
16. A camera was placed outside at night and pointed directly at *Polaris* and several other stars. The lens was kept open and a time-exposure photograph was taken. The diagram below represents that photograph of *Polaris* and star trails, with an angular protractor to measure apparent motion.



How many hours was the lens kept open to create the star trails in this photograph?

- 1) 1 hour 2) 6 hours 3) 3 hours 4) 4 hours

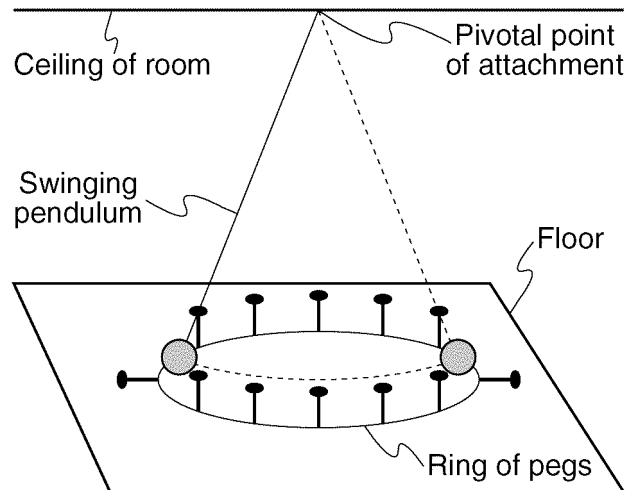
17. The diagram below shows a heavy mass moving back and forth in a straight-line direction. The apparent direction of movement changes over time.



This device provides evidence that

- 1) Earth rotates
2) Earth's axis is tilted
3) Earth revolves
4) Earth has a magnetic pole

18. The diagram below represents a swinging Foucault pendulum.



This pendulum will show an apparent change in the direction of its swing due to Earth's

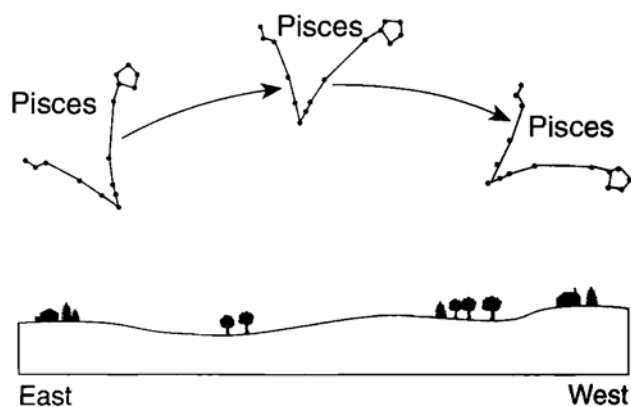
- 1) curved surface 3) rotation
2) tilted axis 4) revolution

19. The apparent rising and setting of the Sun, as viewed from Earth, is caused by

- 1) Earth's rotation 3) the Sun's rotation
2) Earth's revolution 4) the Sun's revolution

20. The best evidence that Earth rotates is provided by the
- 1) location of mid-oceanic ridge volcanoes and the distribution of index fossils
 - 2) movement of Foucault pendulums and the Coriolis effect on air movement
 - 3) pattern of changing seasons and the depth of meteor impacts
 - 4) rate of uranium-238 decay and changes in atmospheric composition

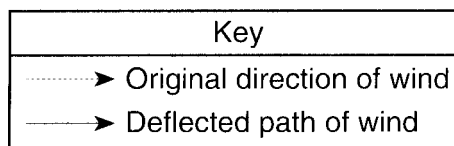
21. The constellation Pisces changes position during a night, as shown in the diagram below.



Which motion is mainly responsible for this change in position?

- 1) revolution of Earth around the Sun
 - 2) rotation of Earth on its axis
 - 3) revolution of Pisces around the Sun
 - 4) rotation of Pisces on its axis
22. The Coriolis effect causes winds in New York State to generally curve
- 1) to the right of the direction of travel
 - 2) to the left of the direction of travel
 - 3) upward away from Earth's surface
 - 4) downward toward Earth's surface
23. Which observable change would occur in New York State if Earth's rate of rotation were one-half its present rate?
- 1) The Sun would rise in the southwest each day.
 - 2) The length of a day would be longer.
 - 3) The time needed to complete a cycle of Moon phases would be greater.
 - 4) The seasonal changes would not occur.
24. The length of an Earth year is based on Earth's
- 1) rotation of $15^\circ/\text{hr}$
 - 2) revolution of $15^\circ/\text{hr}$
 - 3) rotation of approximately $1^\circ/\text{day}$
 - 4) revolution of approximately $1^\circ/\text{day}$

25. Which diagram correctly shows how surface winds are deflected (curved) in the Northern and Southern Hemispheres due to Earth's rotation?

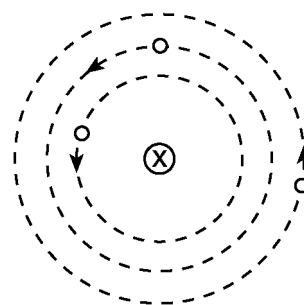


- 1)
- 2)
- 3)
- 4)

26. The day and the year, as units of time, are based upon motions of

- 1) the Earth
- 2) the Moon
- 3) the Sun
- 4) distant stars

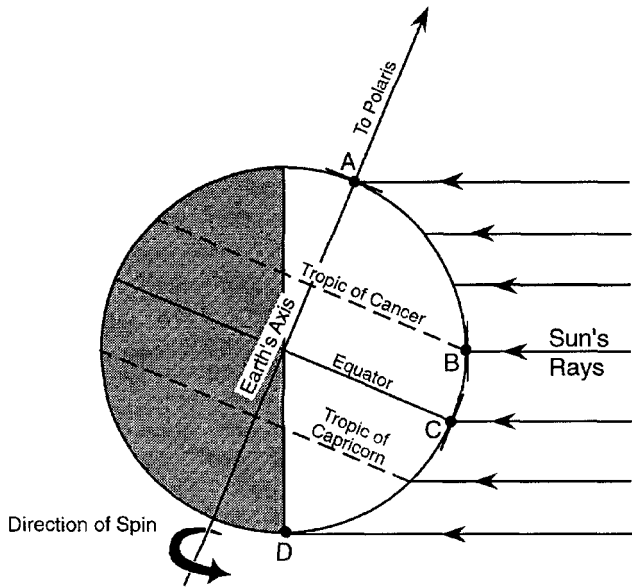
27. The diagram below represents a simple geocentric model. Which object is represented by the letter X?



(Not drawn to scale)

- 1) Earth
 - 2) Sun
 - 3) Moon
 - 4) Polaris
28. Which object orbits Earth in both the Earth-centered (geocentric) and Sun-centered (heliocentric) models of our solar system?
- 1) the Moon
 - 2) the Sun
 - 3) Venus
 - 4) Polaris

Base your answers to questions 29 through 31 on the diagram below. The diagram represents the Earth at a position in orbit around the Sun, the Sun's rays at solar noon, and the direction to *Polaris*. Letters A through D represent positions on the Earth's surface.



29. A projectile is launched from a point near the North Pole toward the Equator. Which diagram best represents the apparent path of the projectile, as viewed from the Earth?

- 1) 2)
- 3) 4)

30. What is the latitude of position A?

- 1) $23\frac{1}{2}^\circ$ N 3) $66\frac{1}{2}^\circ$ N
2) 47° N 4) 90° N

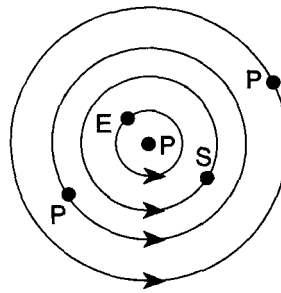
31. Which position is receiving the Sun's rays from directly overhead at solar noon?

- 1) A 3) C
2) B 4) D

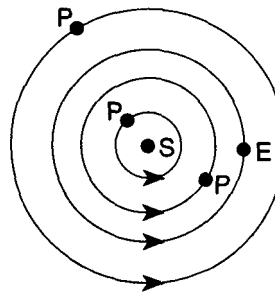
32. Which diagram represents a geocentric model?

[Key: E = Earth, P = Planet, S = Sun]

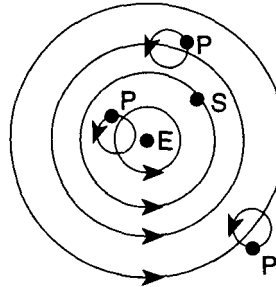
1)



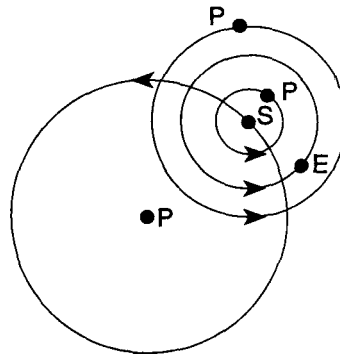
2)



3)



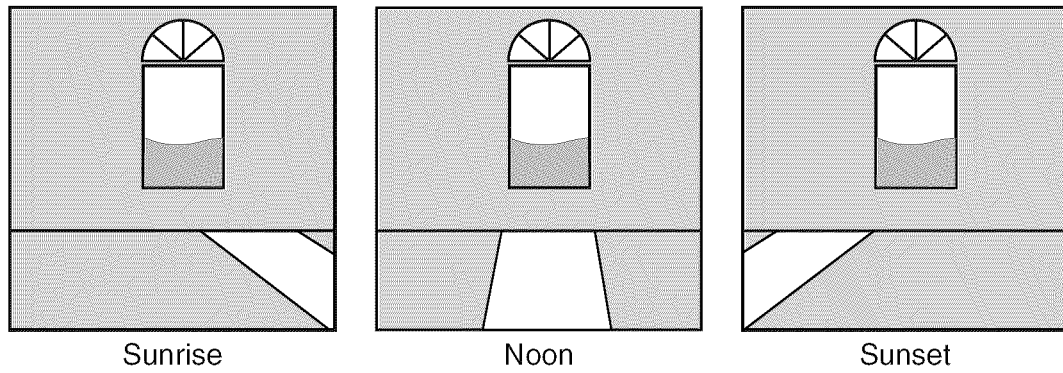
4)



33. For what reason did the heliocentric model of the universe replace the geocentric model of the universe?

- 1) The geocentric model no longer predicted the positions of the constellations.
2) The geocentric model did not predict the phases of the Moon.
3) The heliocentric model provided a simpler explanation of the motions of the planets.
4) The heliocentric model proved that the Earth rotates.

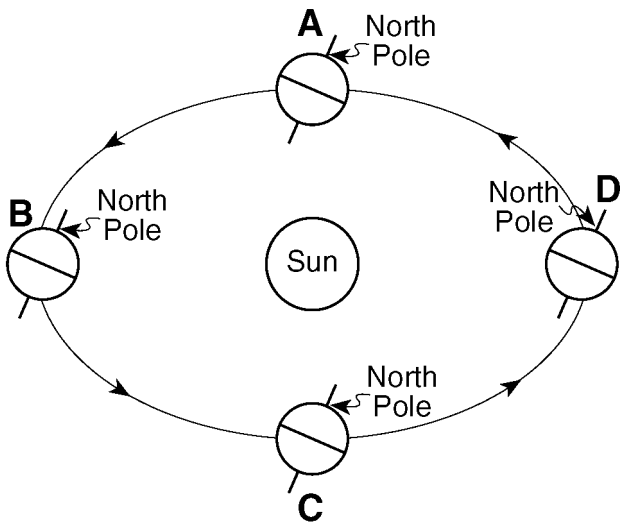
34. Base your answer to the following question on the diagram below, which shows sunlight entering a room through the same window at three different times on the same winter day.



The apparent change in the Sun's position shown in the diagram is best explained by

- 1) the Sun rotating at a rate of 15° per hour
- 2) Earth rotating at a rate of 15° per hour
- 3) the Sun's axis tilted at an angle of $23\frac{1}{2}^\circ$
- 4) Earth's axis tilted at an angle of $23\frac{1}{2}^\circ$

Base your answers to questions 35 and 36 on the diagram below, which represents an exaggerated view of Earth revolving around the Sun. Letters A, B, C, and D represent Earth's location in its orbit on the first day of each of the four seasons.



35. Which observation provides the best evidence that Earth revolves around the Sun?
- 1) Stars seen from Earth appear to circle *Polaris*.
 - 2) Earth's planetary winds are deflected by the Coriolis effect.
 - 3) The change from high ocean tide to low ocean tide is a repeating pattern.
 - 4) Different star constellations are seen from Earth at different times of the year.

36. Earth's rate of revolution around the Sun is approximately

- 1) 1° per day
- 2) 360° per day
- 3) 15° per hour
- 4) 23.5° per hour

Answer Key
[New Exam]

1. 3
2. 4
3. 2
4. 4
5. 2
6. 2
7. 1
8. 4
9. 3
10. 1
11. 4
12. 3
13. 3
14. 4
15. 4
16. 4
17. 1
18. 3
19. 1
20. 2
21. 2
22. 1
23. 2
24. 4
25. 3
26. 1
27. 1
28. 1
29. 4
30. 4

31. 2
 32. 3
 33. 3
 34. 2
 35. 4
 36. 1
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