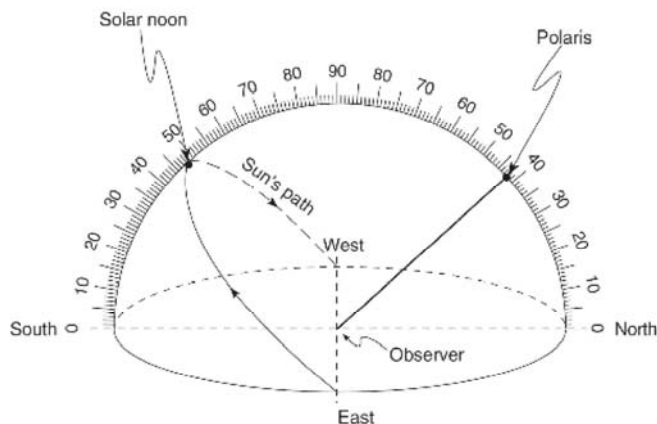


~~Celestial Spheres, Heliocentric, Geocentric~~
Rotation and Revolution Review HW

ame

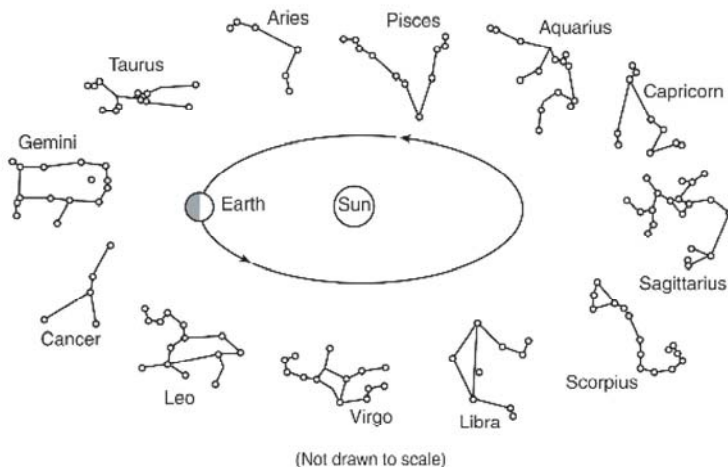
1. The entire constellation of Orion is visible in the night sky in January to an observer in New York State. Which statement explains why this constellation is *not* visible in the night sky to this observer in June?
 - 1) Earth rotates on its axis.
 - 2) Earth revolves around the Sun.
 - 3) The constellation Orion orbits the Sun.
 - 4) The tilt of Earth's axis changes throughout the year
2. Approximately how many degrees per day does Earth revolve in its orbit around the Sun?
 - 1) 1°
 - 2) 13°
 - 3) 15°
 - 4) 23.5°

Base your answers to questions 3 and 4 on the diagram below, which represents a model of the sky (celestial sphere) for an observer in New York State. The curved arrow represents the Sun's apparent path for part of one day. The altitude of *Polaris* is also indicated.



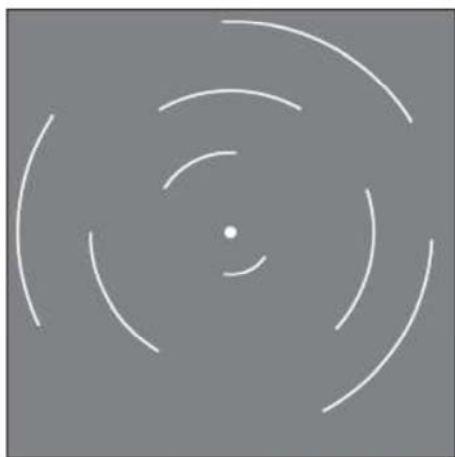
3. According to this diagram, what is the Sun's altitude at solar noon?
 - 1) 23.5°
 - 2) 42°
 - 3) 48°
 - 4) 90°
 4. Where is this observer most likely located?
 - 1) Massena
 - 2) Oswego
 - 3) Slide Mountain
 - 4) Mt. Marcy
-
5. To a nighttime observer on Earth, how many degrees do the stars appear to move around *Polaris* in 3 hours?
 - 1) 60°
 - 2) 45°
 - 3) 3°
 - 4) 15°
 6. The spinning of Earth on its axis causes the apparent rising and setting of the
 - 1) Sun, only
 - 2) Sun and the Moon, only
 - 3) Moon and some stars, only
 - 4) Sun, the Moon, and some stars
 7. The direction of swing of a Foucault pendulum appears to change due to Earth's
 - 1) revolution
 - 2) rotation
 - 3) spherical shape
 - 4) elliptical orbit

8. The diagram below represents some constellations and one position of Earth in its orbit around the Sun. These constellations are visible to an observer on Earth at different times of the year.



When Earth is located in the orbital position shown, two constellations that are both visible to an observer on Earth at midnight are

- 1) Libra and Virgo
 - 2) Gemini and Taurus
 - 3) Aquarius and Capricorn
 - 4) Cancer and Sagittarius
9. At a location in the Northern Hemisphere, a camera was placed outside at night with the lens pointing straight up. The shutter was left open for four hours, resulting in the star trails shown below.



At which latitude were these star trails observed?

- 1) 1° N
- 2) 30° N
- 3) 60° N
- 4) 90° N

10. 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

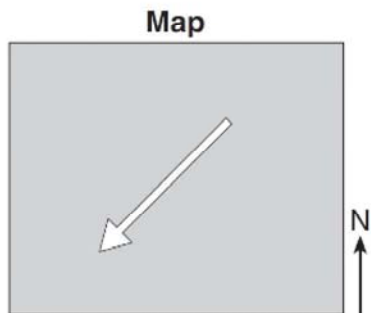
11. The Foucault pendulum provides evidence of Earth's

- 1) revolution around the Sun in a geocentric solar system
- 2) revolution around the Sun in a heliocentric solar system
- 3) rotation on its axis in a geocentric solar system
- 4) rotation on its axis in a heliocentric solar system

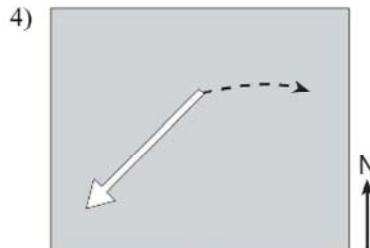
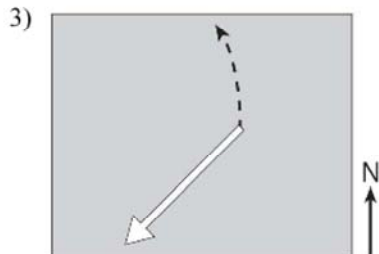
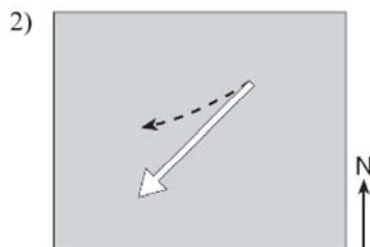
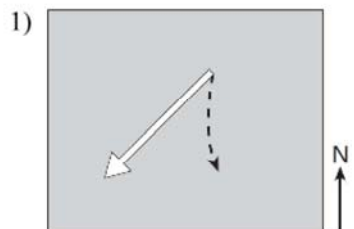
12. The deflection of Earth's planetary winds is an example of

- 1) the Coriolis effect
- 2) the Doppler effect
- 3) convection
- 4) gravitational pull

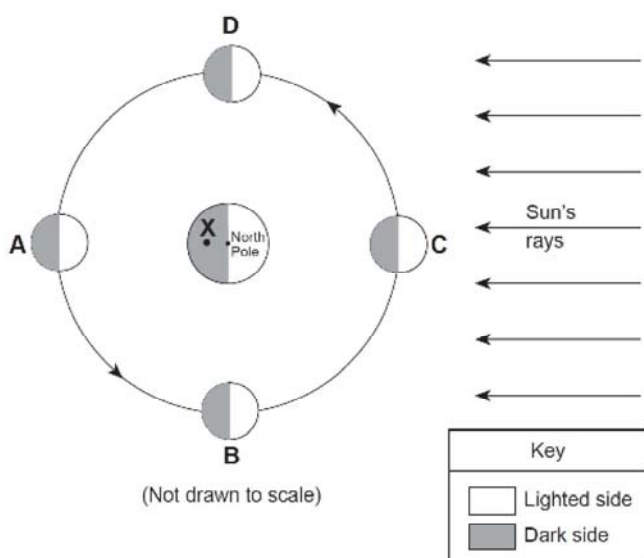
13. The arrow on the map below represents the direction a wind is blowing over a land surface in the Northern Hemisphere *without* showing the Coriolis effect.



Which dashed arrow represents how the wind direction will change in the Northern Hemisphere due to the Coriolis effect?

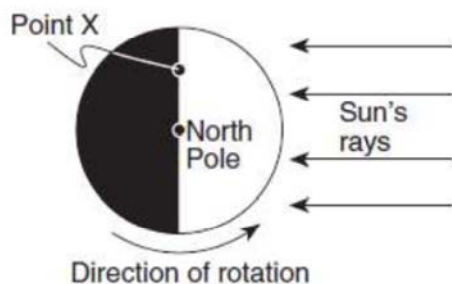


14. In the Northern Hemisphere, planetary winds deflect to the
- 1) right, due to the Coriolis effect
 - 2) right, due to the Doppler effect
 - 3) left, due to the Coriolis effect
 - 4) left, due to the Doppler effect
15. If Earth's rate of rotation increases, the length of one Earth day will be
- 1) shorter than 24 hours
 - 2) longer than 24 hours
 - 3) 24 hours, with a shorter nighttime period
 - 4) 24 hours, with a longer nighttime period
16. Base your answer to the following question on the diagram below, which shows Earth and the Moon in relation to the Sun. Positions *A*, *B*, *C*, and *D* show the Moon at specific locations in its orbit. Point *X* is a location on Earth's surface.



- What is the time of day at point *X*?
- 1) 6 a.m.
 - 2) noon
 - 3) 6 p.m.
 - 4) midnight

17. The diagram below represents the direction of Earth's rotation as it appears from above the North Pole. Point *X* is a location on Earth's surface.



- The time at point *X* is closest to
- 1) 6 a.m.
 - 2) 12 noon
 - 3) 6 p.m.
 - 4) 12 midnight

18. In which type of model are the Sun, other stars, and the Moon in orbit around the Earth?

- 1) heliocentric model
- 2) tetrahedral model
- 3) concentric model
- 4) geocentric model

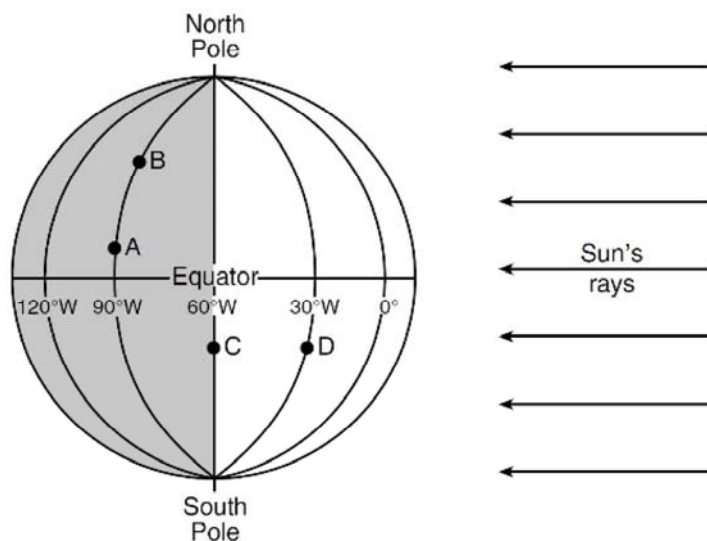
19. Which apparent motion can be explained by a geocentric model?

- 1) deflection of the wind
- 2) curved path of projectiles
- 3) motion of a Foucault pendulum
- 4) the sun's path through the sky

20. 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.

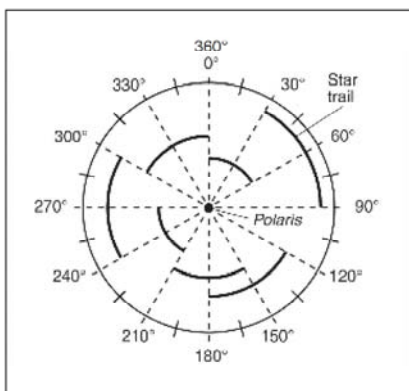
Base your answers to questions **21** and **22** on the diagram below and on your knowledge of Earth Science. The diagram represents Earth on the first day of a season. The equator, several lines of longitude, and the North and South Poles have been labeled. Letters *A* through *D* represent locations on Earth's surface.



21. 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.

22. State whether the relative altitude of *Polaris* at location *A* is lower or higher than at location *B*. Explain why this difference is observed.

Base your answers to questions 23 and 24 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.



23. Determine the number of hours it took to record the star trails labeled on the diagram.
24. Identify the motion of Earth that causes these stars to appear to move in a circular path.
25. Draw the path of the sun for May 16

