1. Earth's rate of revolution is approximately

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

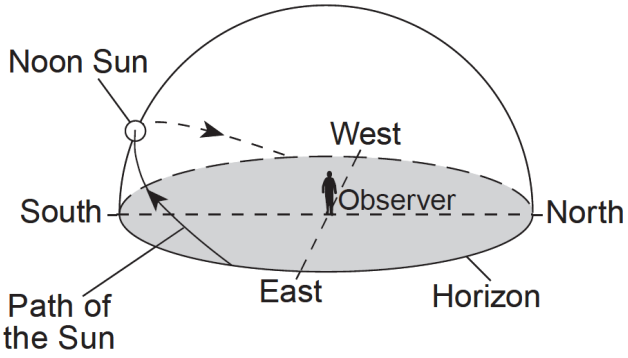
2. The entire constellation of Orion is visible in the night sky in January to an observer in New York State. Which statement explains why this constellation is *not* visible in the night sky to this observer in June?

   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

3. Which observation provides the best evidence that Earth orbits the Sun?

   1) The Sun has a cyclic pattern of sunspot events.
   2) The Sun appears to rise and set in a cyclic pattern.
   3) The constellations that can be seen at night from Earth change with the seasons.
   4) The constellations appear to move in a circular pattern around Earth.

4. The model below shows the apparent path of the Sun as seen by an observer in New York State on the first day of one of the four seasons.



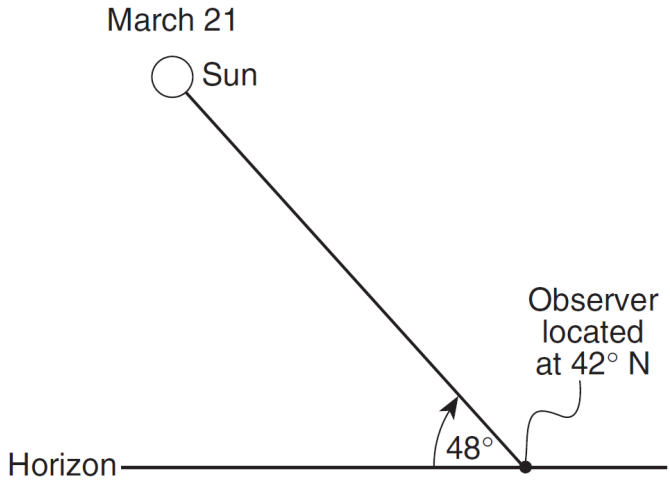
   This apparent path of the Sun was observed on the first day of

   1) spring
   2) summer
   3) fall
   4) winter

5. During how many days of a calendar year is the Sun directly overhead at noon in New Jersey?

   1) only 1 day
   2) only 2 days
   3) 365 days
   4) 0 days

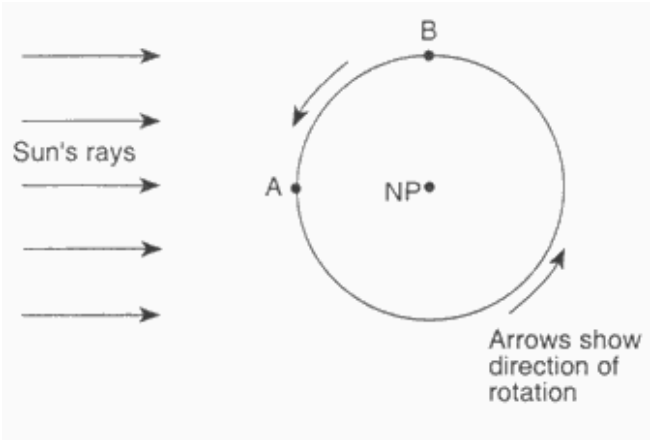
6. The diagram below shows the altitude of the Sun at solar noon on March 21, as seen by an observer at 42° N latitude.



   Compared to the altitude of the Sun observed at solar noon on March 21, the altitude of the Sun observed at solar noon on June 21 will be

   1) 15° higher in the sky
   2) 23.5° higher in the sky
   3) 42° higher in the sky
   4) 48° higher in the sky

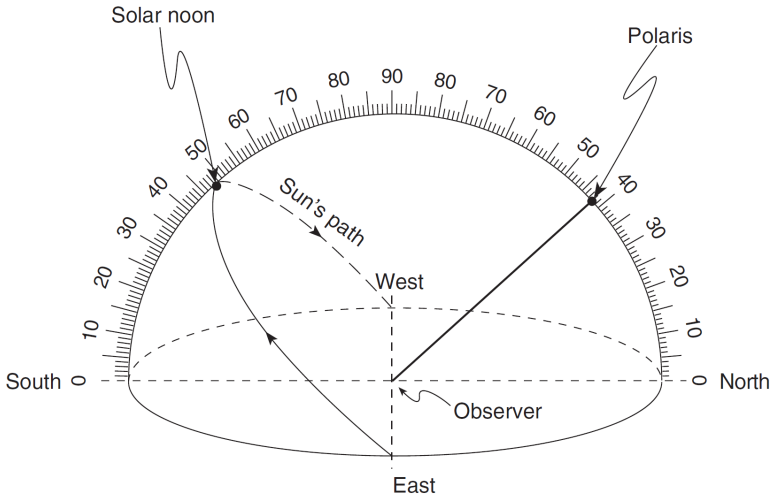
7. The diagram below shows Earth as viewed from above the North Pole (NP). Points *A* and *B* are locations on Earth's surface.



   At location *A*, the time is 12 noon. What is the time at location *B*?

   1) 6 a.m.
   2) 6 p.m.
   3) 3 p.m.
   4) 12 midnight

Base your answers to questions **8** and **9** 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.



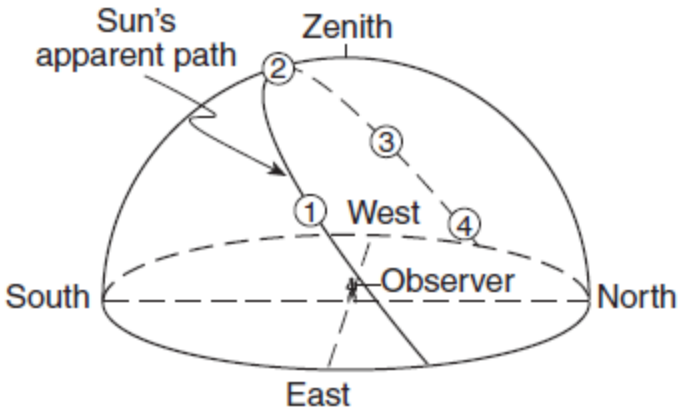
8. On which date could this observation of the Sun's apparent path have been made?

   1) March 21 2) July 21 3) October 21 4) December 21

9. Where is this observer most likely located?

   1) Massena 2) Oswego 3) Slide Mountain 4) Mt. Marcy

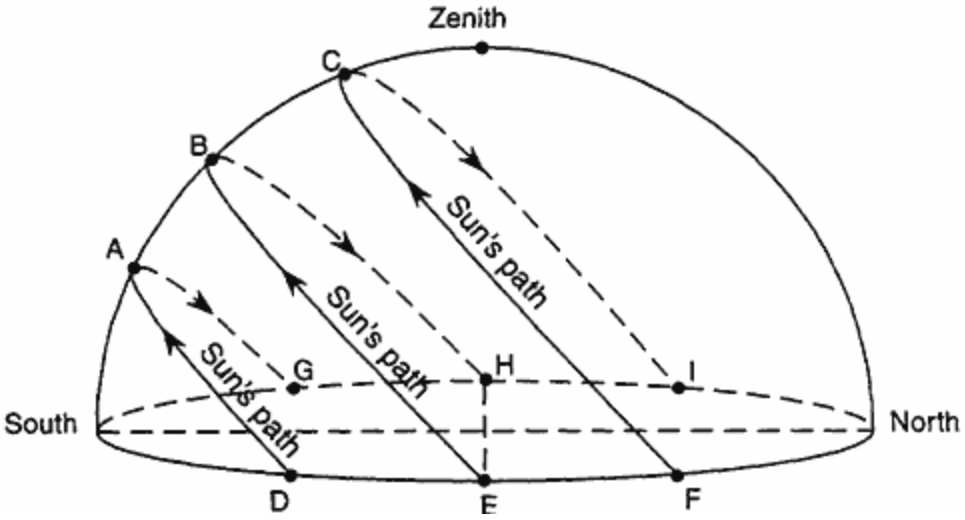
10. Base your answer to the following question on the diagram below, which shows numbered positions of the Sun at four different times along the Sun's apparent daily path, as seen by an observer in New Jersey. Numbers 1 through represent apparent positions of the Sun.



The observer had the shortest shadow when the Sun was at position

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

11 The diagram below represents a plastic hemisphere upon which lines have been drawn to show the apparent paths of the Sun at a location in New York State on the first day of each season. Letters *A* through *I* represent points on the paths.



Which point represents the sunrise location on the first day of summer?

1) *G* 2) *F* 3) *E* 4) *D*