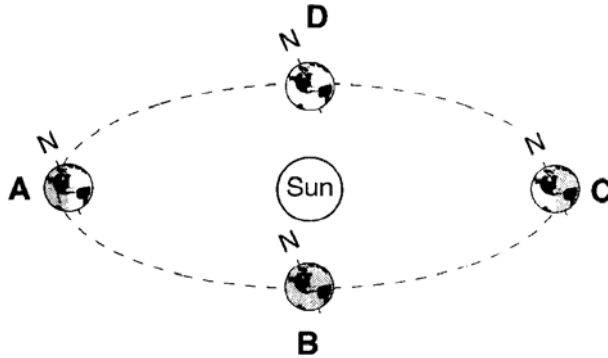


Midterm Prep-Seasons/Suns Path 2

1. How many degrees does the Sun appear to move across the sky in four hours?
A) 60° B) 45° C) 15° D) 4°
2. 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)

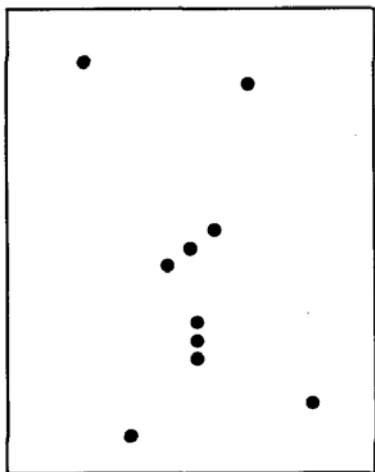
Which event is caused by Earth's revolution?

- A) the apparent shift in the path of a Foucault pendulum
- B) deflection of planetary winds to the right in the Northern Hemisphere
- C) the apparent rising and setting of the Sun
- D) different constellations observed in the night sky throughout the year



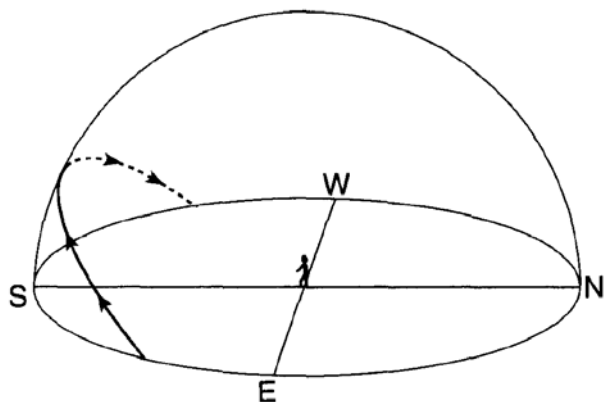
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3. The diagram below represents the major stars of the constellation Orion, as viewed by an observer in New Jersey.



Which statement best explains why Orion can be observed from New York State on December 21 but not on June 21?

- A) Orion has an eccentric orbit around Earth.
 - B) Orion has an eccentric orbit around the Sun.
 - C) Earth revolves around the Sun.
 - D) Earth rotates on its axis.
4. The model below shows the Sun's apparent path across the sky for an observer in New York State.

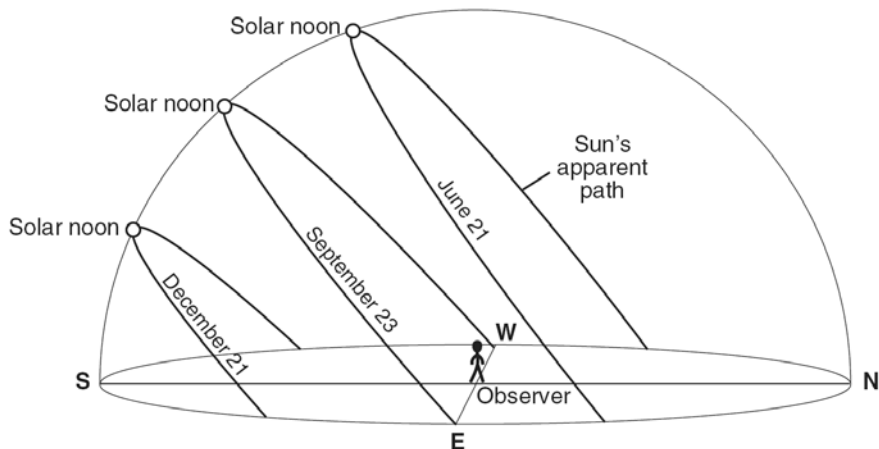


On which day of the year was this path observed?

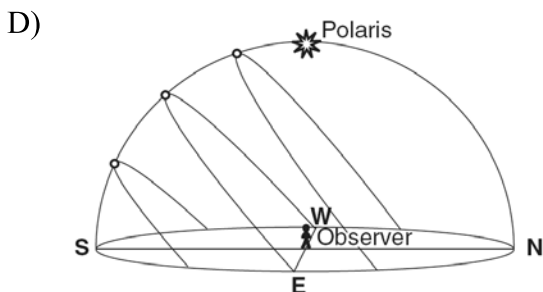
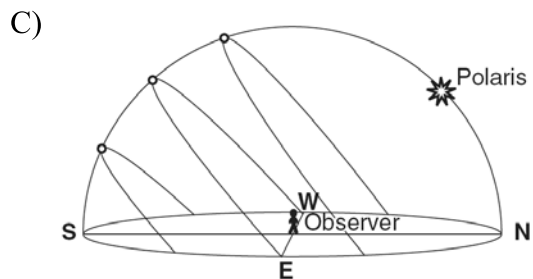
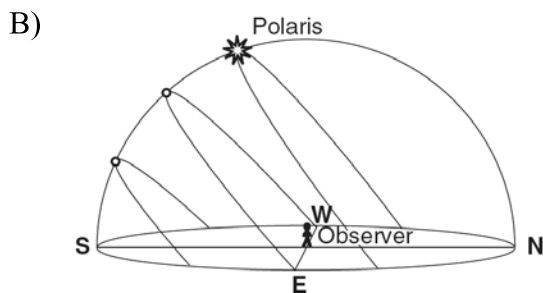
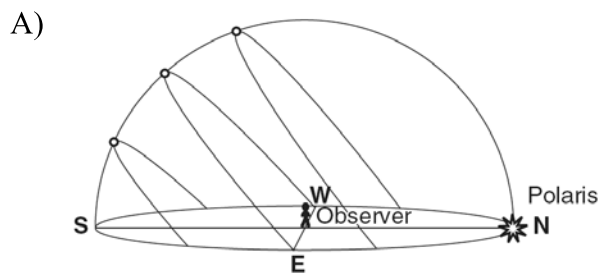
- A) March 21
 - B) June 21
 - C) September 21
 - D) December 21
-

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Base your answers to questions 5 through 7 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.

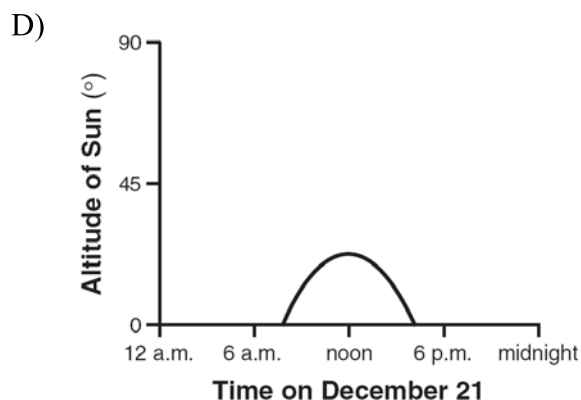
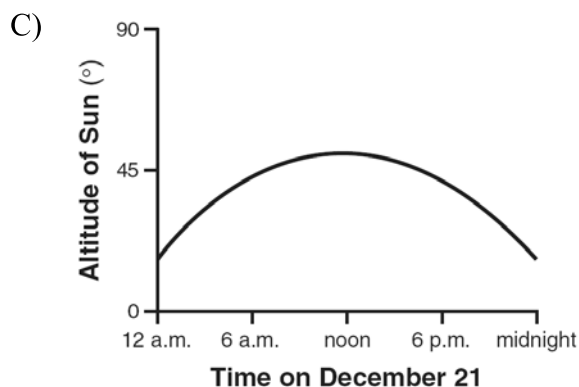
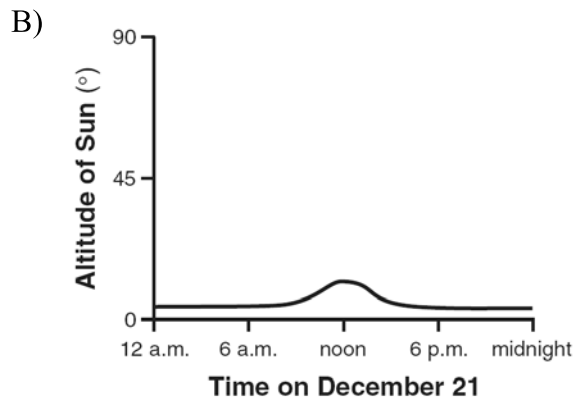
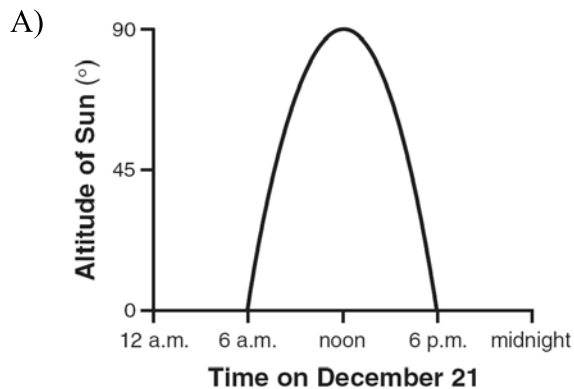


5. Which diagram best shows the location of *Polaris* relative to the observer?



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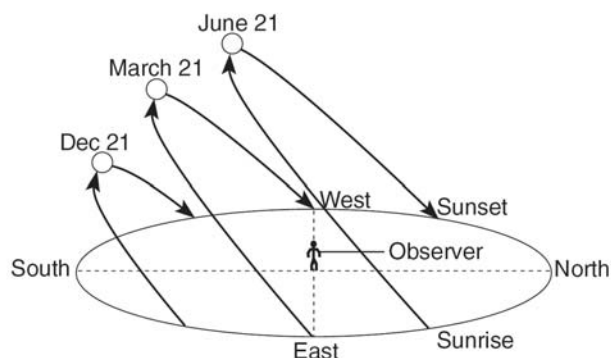
6. Which graph best shows the altitude of the Sun, as measured by the observer located at 42° N, at various times on December 21?



7. In which direction will sunrise occur on June 21?

- | | |
|----------------------|----------------------|
| A) north of due west | B) north of due east |
| C) south of due west | D) south of due east |

8. The diagram below shows the apparent daily path of the Sun, as viewed by an observer at a certain latitude on three different days of the year.

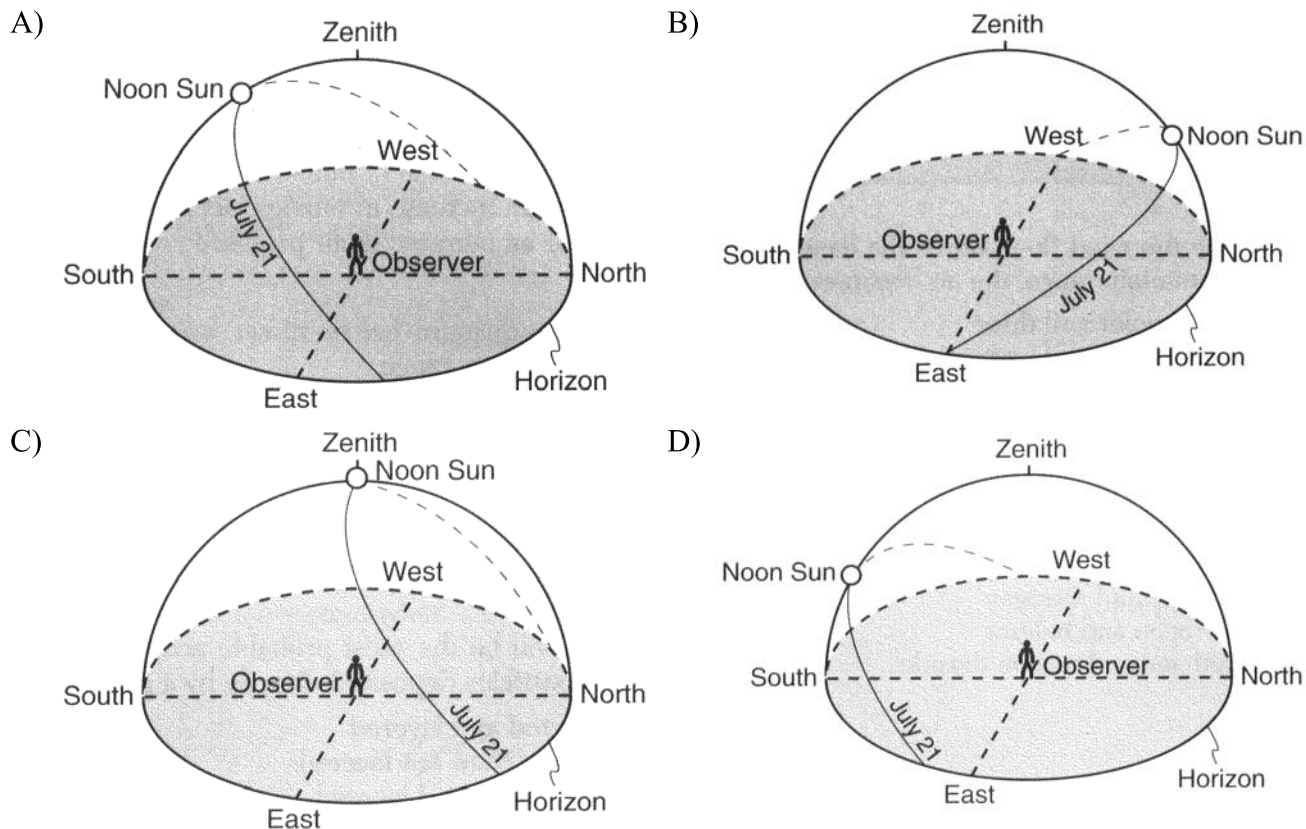


At which latitude were these apparent Sun paths most likely observed?

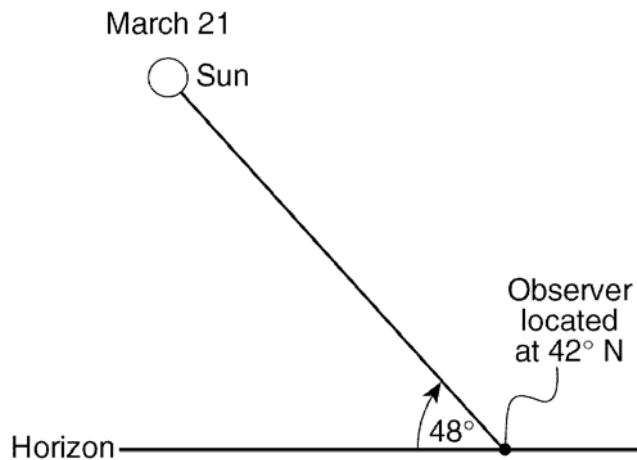
- | | |
|-----------------|-------------------|
| A) 0° | B) 23.5° N |
| C) 43° N | D) 66.5° N |

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9. Which diagram best shows the Sun's apparent path, as seen by an observer on July 21 in New Jersey?



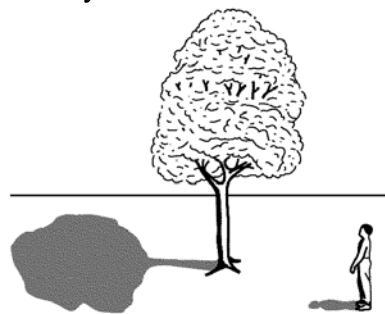
10. The diagram below shows the altitude of the Sun at solar noon on March 21, as seen by an observer at 42° N latitude.



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

- A) 15° higher in the sky
- B) 23.5° higher in the sky
- C) 42° higher in the sky
- D) 48° higher in the sky

11. The diagram below shows the noontime shadows cast by a student and a tree.

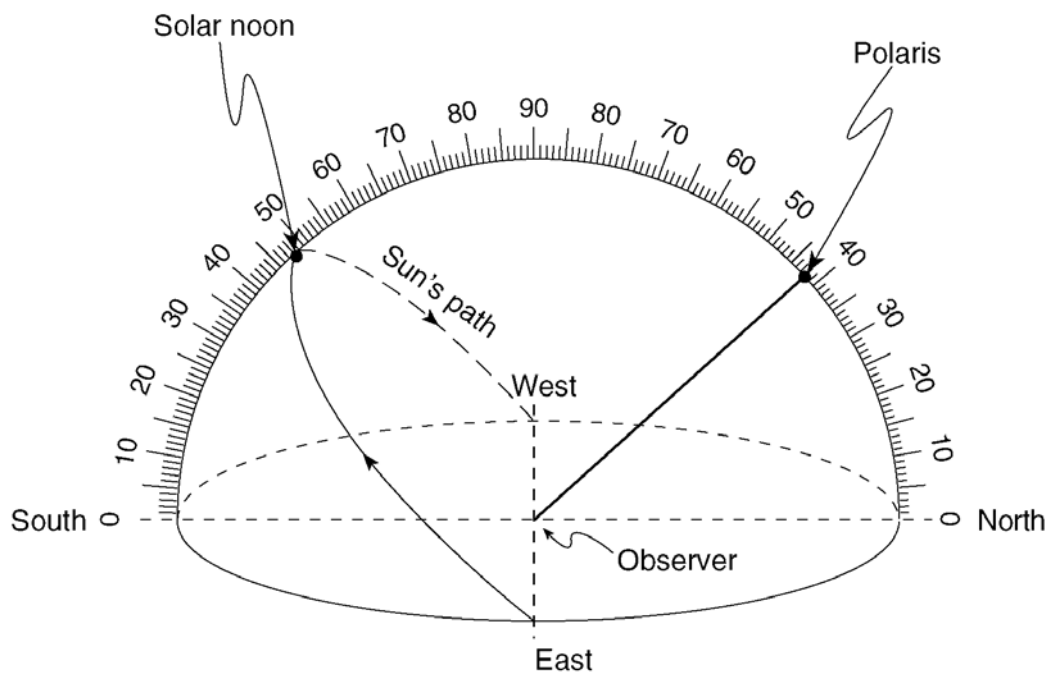


If the time is solar noon and the student is located in New York State, in what direction is the student facing?

- A) north
- B) south
- C) east
- D) west

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Base your answers to questions 12 through 14 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.



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

- A) March 21 B) July 21 C) October 21 D) December 21

13. Where is this observer most likely located?

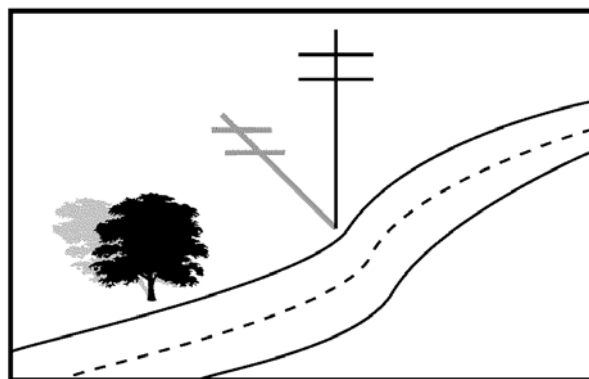
- A) Massena B) Oswego
C) Slide Mountain D) Mt. Marcy

14. According to this diagram, what is the Sun's altitude at solar noon?

- A) 23.5° B) 42° C) 48° D) 90°

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15. The diagram below shows the shadow cast by a telephone pole on March 21 at solar noon at a location in New York State.

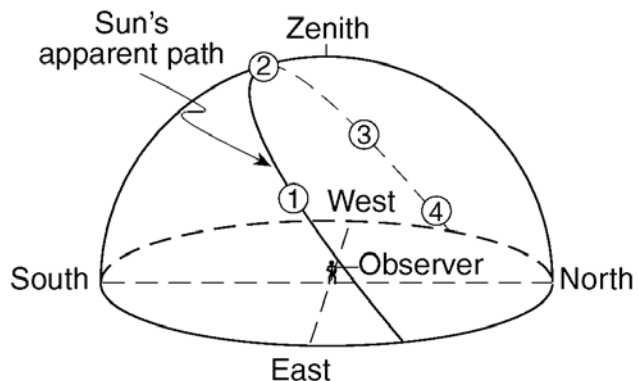


Shadow Cast on March 21

Which shadow was cast by the same telephone pole on June 21 at solar noon?

- A) B)
- C) D)

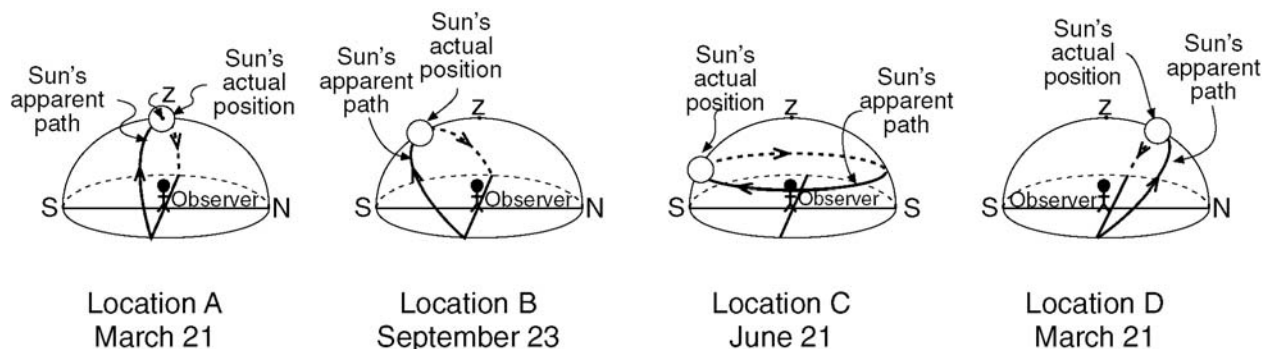
Base your answers to questions 16 and 17 on the diagram below, which shows numbered positions of the Sun at four different times along the Sun's apparent daily path, as seen by an observer in New Jersey. Numbers 1 through 4 represent apparent positions of the Sun.



16. During which day of the year is the Sun most likely to follow the apparent path shown?
- A) March 1 B) July 1
 C) October 1 D) December 1
17. The observer had the longest shadow when the Sun was at position
- A) 1 B) 2 C) 3 D) 4

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Base your answers to questions **18** through **20** on the diagram below, which shows a model of the apparent path and position of the Sun in relation to an observer at four different locations, *A*, *B*, *C*, and *D*, on Earth's surface on the dates indicated. The zenith (*z*) and the actual position of the Sun in the model at the time of the observation are shown. [The zenith is the point directly over the observer.]



18. From sunrise to sunset at location *B*, the length of the observer's shadow will
 - A) increase, only
 - B) decrease, only
 - C) increase, then decrease
 - D) decrease, then increase

19. Where on Earth's surface is the observer at location *C* located?
 - A) at the Equator
 - B) at the South Pole
 - C) at the North Pole
 - D) in Oswego, New York

20. According to the Sun's actual position shown in the diagrams, the most intense insolation is being received by the observer at location
 - A) *A*
 - B) *B*
 - C) *C*
 - D) *D*