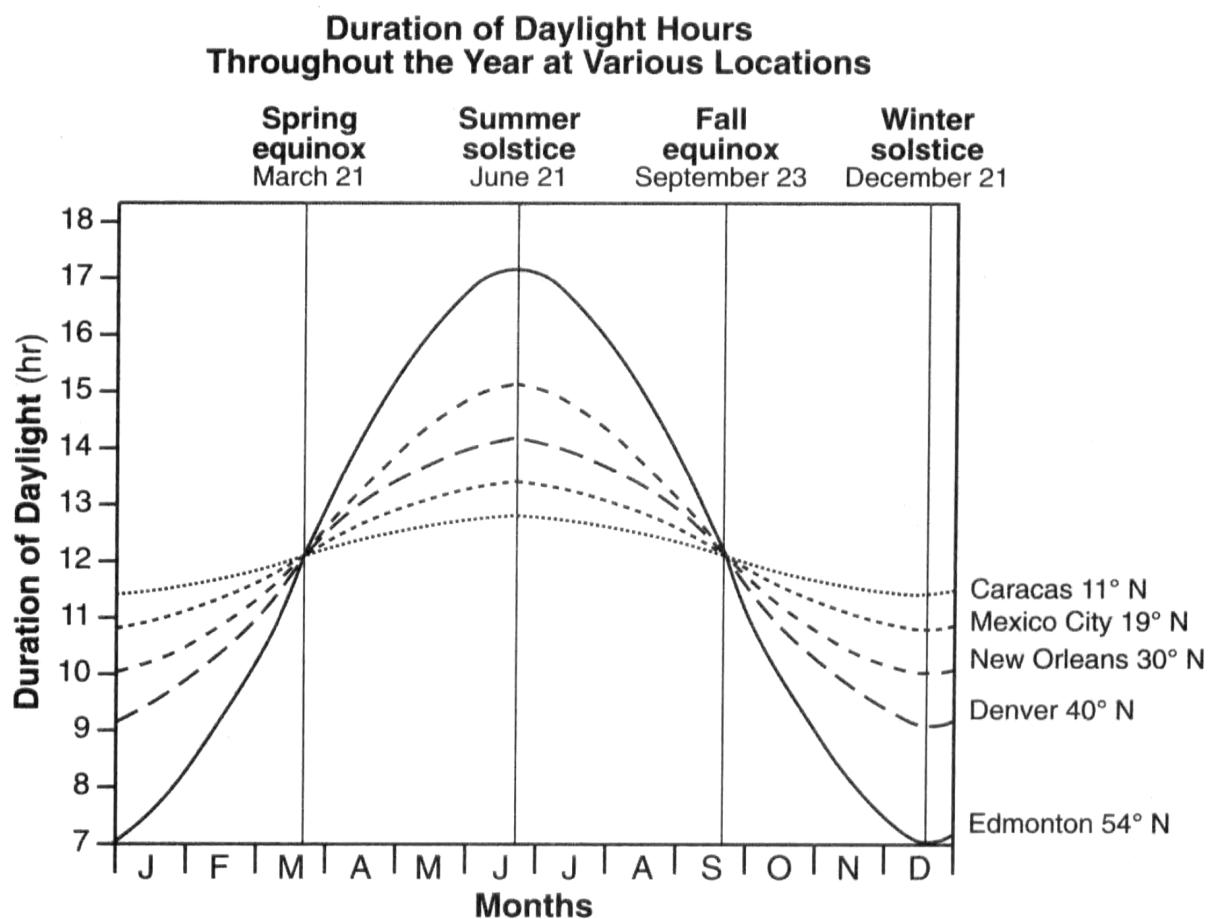


1. Base your answer to the following question on the graph below, which shows the duration of daylight hours throughout the year for five cities located in the Northern Hemisphere.



Which city experiences the greatest variation in daylight hours during one year?

- 1) Caracas 2) Mexico City 3) New Orleans 4) Edmonton

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°

3. During which month does the Sun appear to rise farthest north of due east for an observer in New York State?

- 1) December 3) June
2) January 4) July

4. How many days are required for the Moon to go from one full-Moon phase to the next full-Moon phase when viewed from Earth?

- 1) 24 2) 27.3 3) 29.5 4) 365

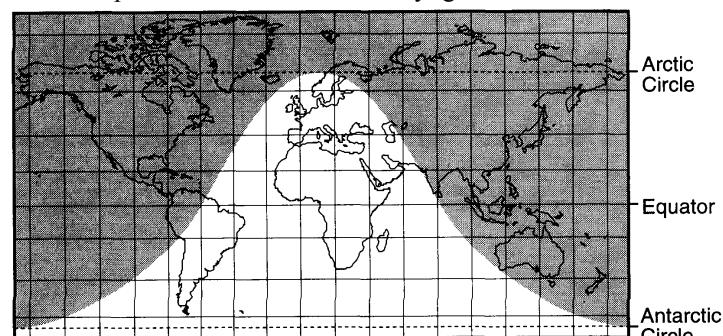
5. One complete cycle of the phases of the Moon takes approximately one

- 1) day 2) week 3) month 4) year

6. The passage of the Moon into Earth's shadow causes a

- 1) lunar eclipse 3) new Moon
2) solar eclipse 4) full Moon

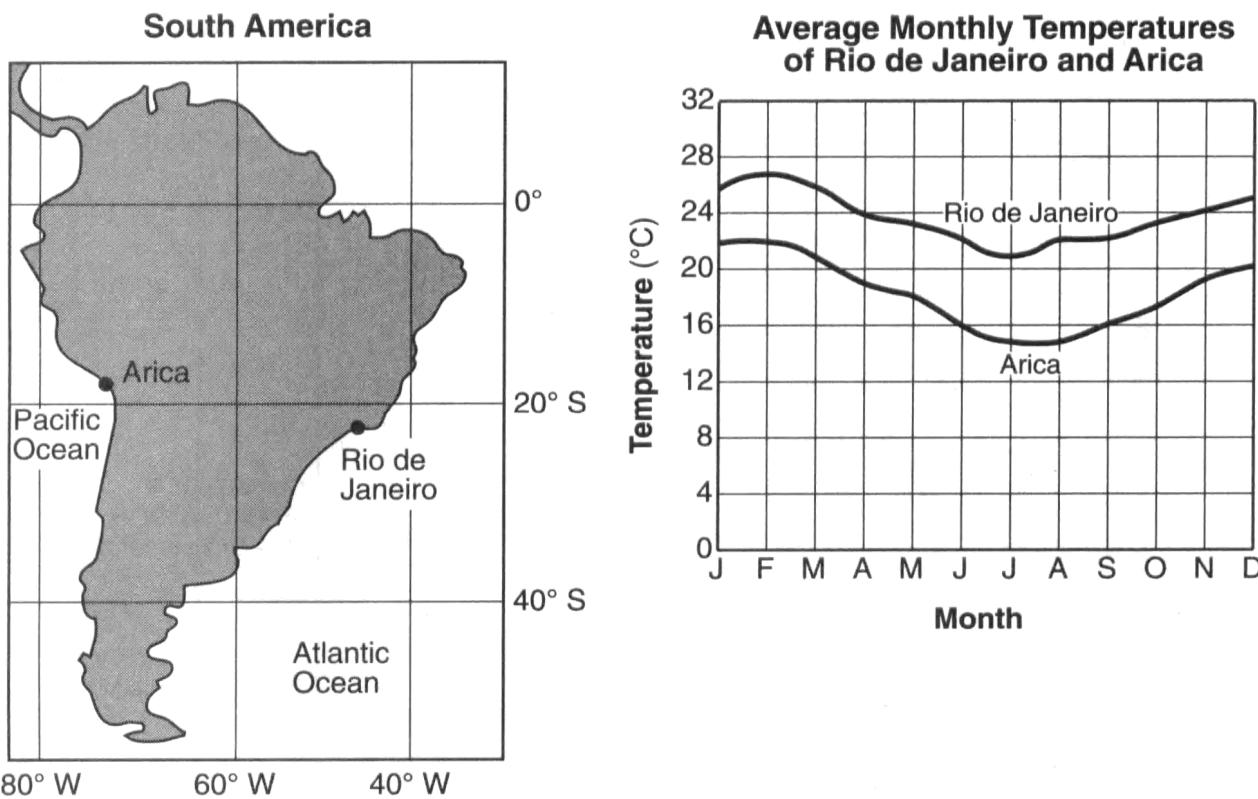
7. The shaded portion of the map below indicates areas of night and the unshaded portion indicates areas of daylight.



What day of the year is best represented by the map?

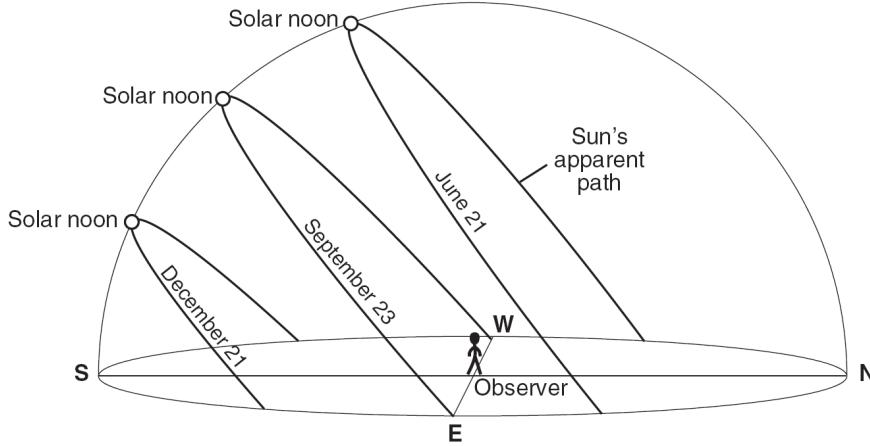
- 1) March 21 3) September 21
2) June 21 4) December 21

8. Base your answer to the following question on the map and graph below. The map shows two cities, Arica and Rio de Janeiro, located on opposite coasts of South America. Both cities are near sea level. The graph shows the average monthly temperatures for the cities.



The summer season at Arica and Rio de Janeiro occurs from approximately

9. Base your answer to the following question 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.



In which direction will sunrise occur on June 21?

- 1) north of due west 2) north of due east 3) south of due west 4) south of due east

10. How does the position of *Polaris* appear to change as an observer travels due north from the Equator?

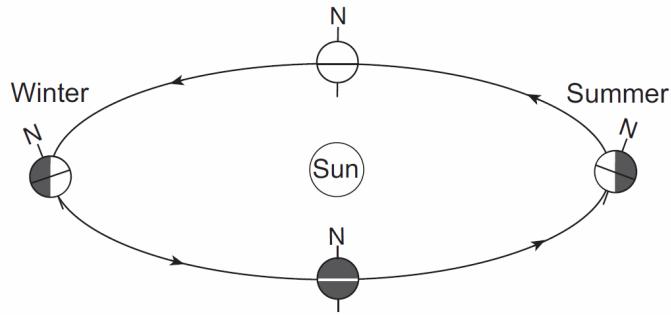
- 1) The angle of *Polaris* above the northern horizon decreases.
 - 2) The angle of *Polaris* above the northern horizon increases.
 - 3) *Polaris* appears to move westward.
 - 4) *Polaris* appears to move eastward.

11. The direction of swing of a Foucault pendulum appears to change due to Earth's

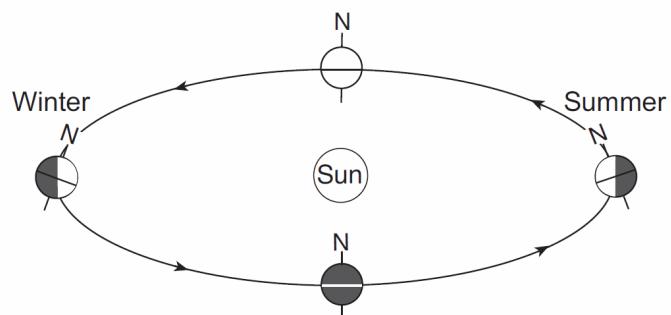
- 1) revolution
 - 2) rotation
 - 3) spherical shape
 - 4) elliptical orbit

12 Which diagram best represents the tilt of Earth's axis that causes the Northern Hemisphere seasons shown? (Diagrams are not drawn to scale.)

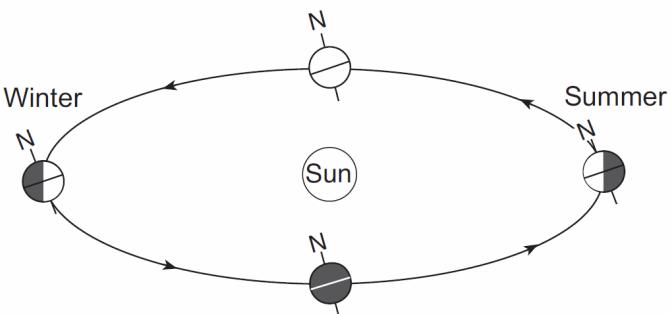
1)



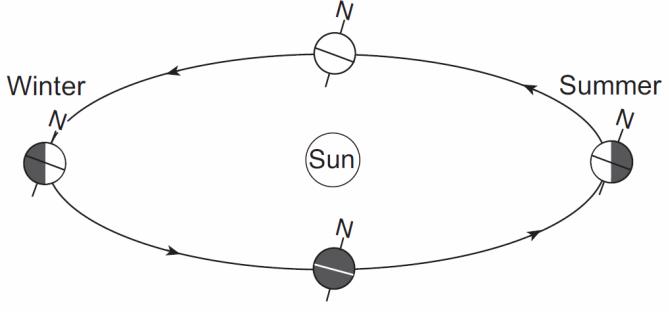
2)



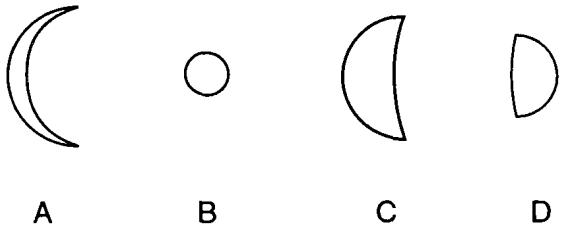
3)



4)



13. The diagrams below represent photographs of Venus at four different positions in its orbit, as taken from Earth.



At which position is Venus closest to Earth?

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

14. What is the total number of degrees that the Earth rotates on its axis during a 12-hour period?

- 1) 1° 2) 15° 3) 180° 4) 360°

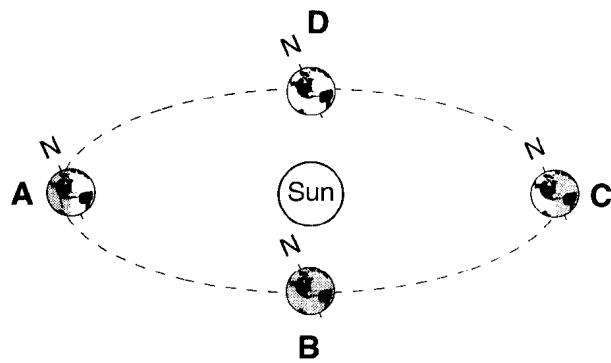
15. Which motion causes the Coriolis effect on Earth?

- 1) revolution of Earth around the Sun
2) revolution of the Moon around Earth
3) rotation of Earth on its axis
4) rotation of the Moon on its axis

16. Which object orbits Earth in both the Earth-centered (geocentric) and Sun-centered (heliocentric) models of our solar system?

- 1) the Moon 3) Venus
2) the Sun 4) Polaris

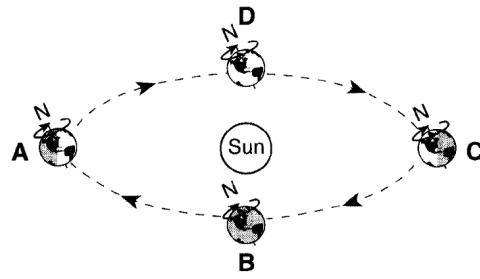
17. Base your answer to the following question on the diagram below, which represents Earth in its orbit around the Sun. The position of Earth on the first day of each season is labeled A, B, C, and D.



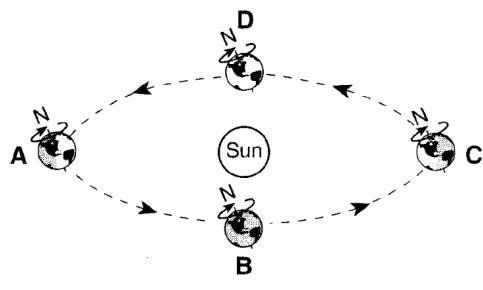
(Not drawn to scale)

Which diagram correctly shows the directions of Earth's revolution and rotation?

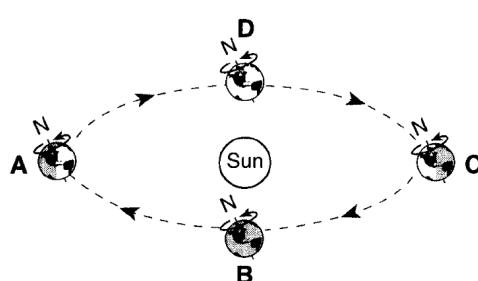
1)



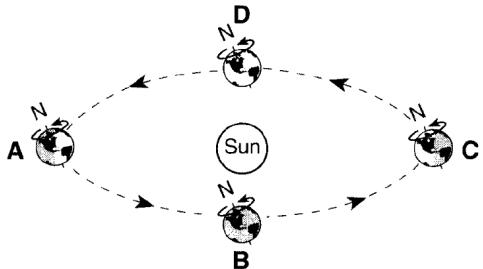
3)



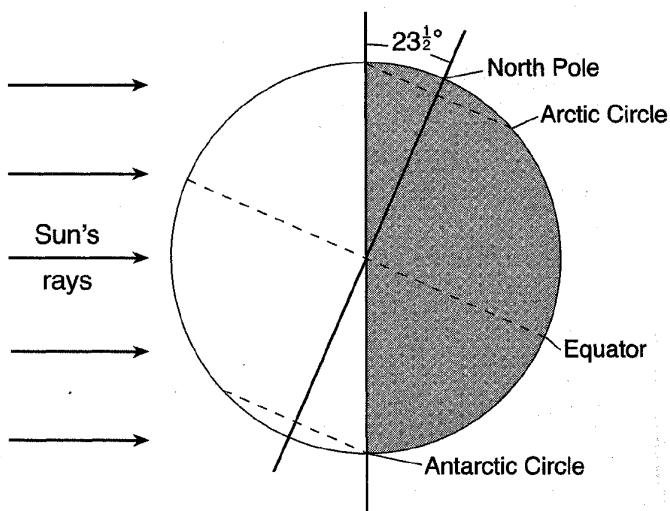
2)



4)



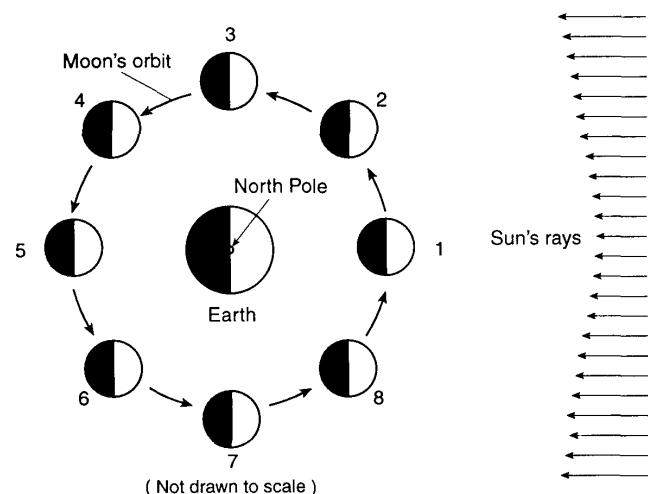
18. The diagram below shows Earth as viewed from space.



Which season is beginning in the Northern Hemisphere?

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

19. The diagram below shows the Moon orbiting Earth as viewed from space above the North Pole. The Moon is shown at eight different positions in its orbit.



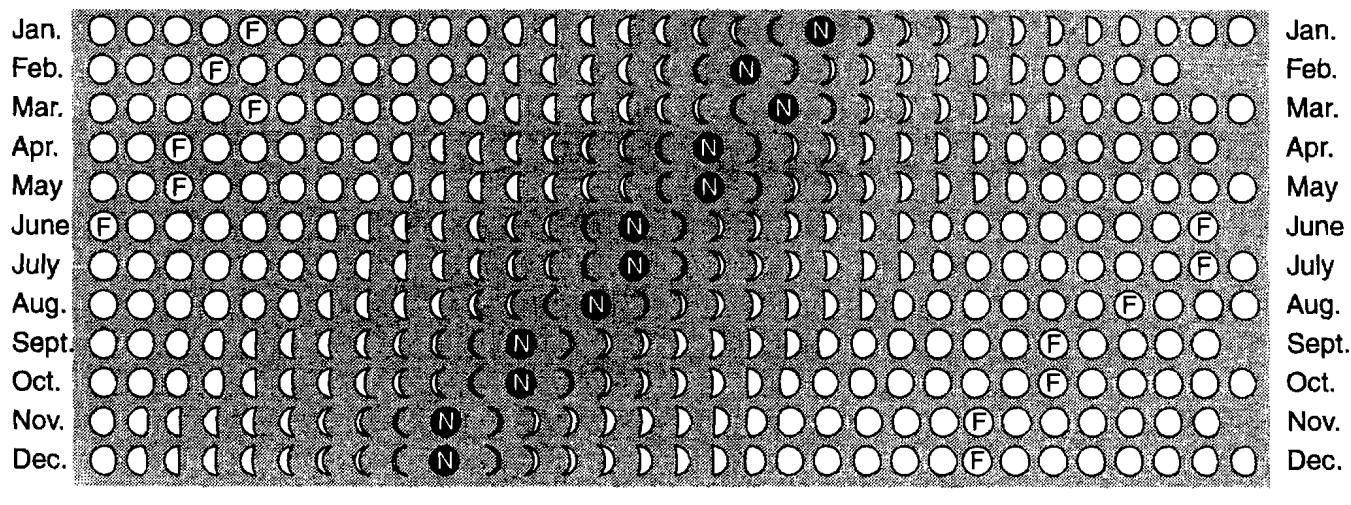
(Not drawn to scale)

At which two positions of the Moon is an eclipse of the Sun or Moon possible?

- 1) 1 and 5 2) 2 and 6 3) 3 and 7 4) 4 and 8

Base your answers to questions **20** and **21** on the chart below, which shows phases of the Moon as viewed by an observer on Earth during 1996.

1996 Lunar Phases



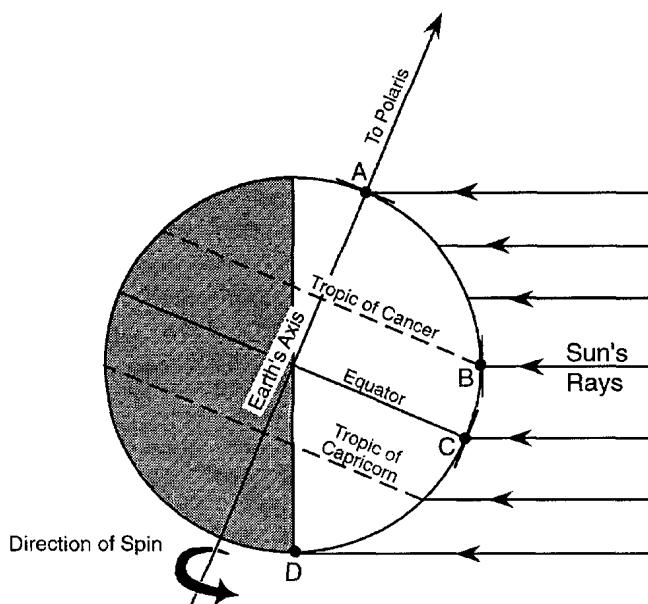
20. What is the approximate diameter of the Moon?

1) 1.74×10^3 km 2) 6.96×10^5 km 3) 3.48×10^3 km 4) 7.35×10^{22} km

21. Why does the Moon show these phases when viewed by an observer on Earth?

1) The Moon rotates on its axis. 3) The Sun lights only half of Earth.
2) Earth's orbit is nearly circular. 4) The Moon revolves around Earth.

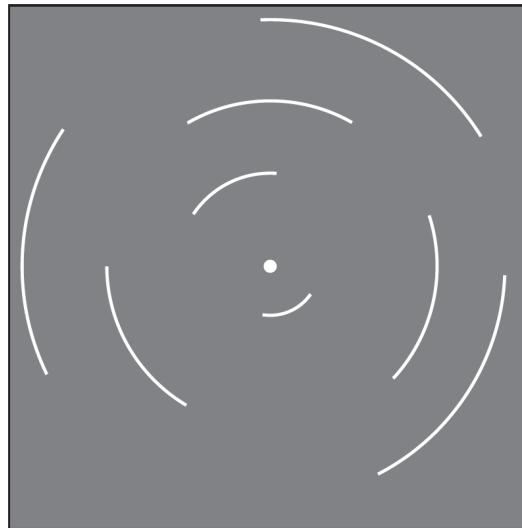
22. Base your answer to the following question on the diagram below. The diagram represents the Earth at a position in orbit around the Sun, the Sun's rays at solar noon, and the direction to *Polaris*. Letters *A* through *D* represent positions on the Earth's surface.



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

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

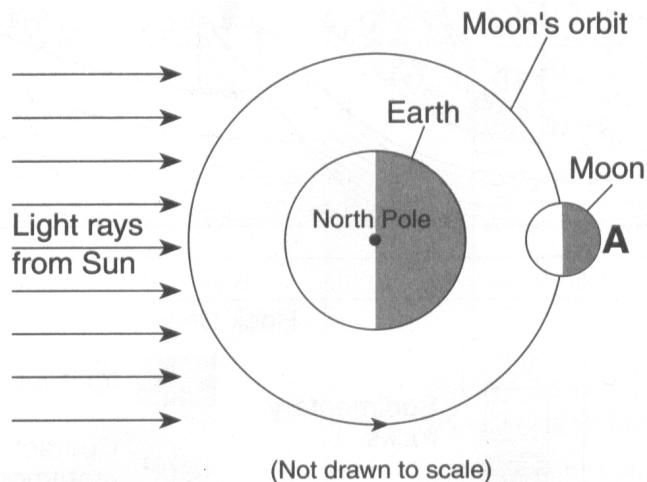
23. At a location in the Northern Hemisphere, a camera was placed outside at night with the lens pointing straight up. The shutter was left open for four hours, resulting in the star trails shown below.



At which latitude were these star trails observed?

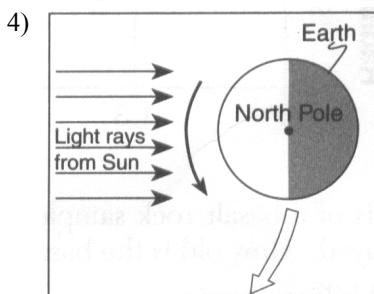
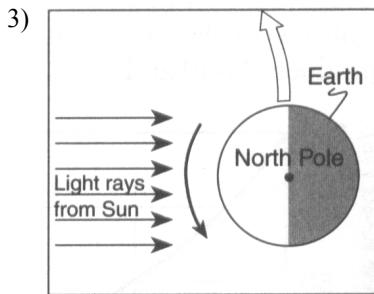
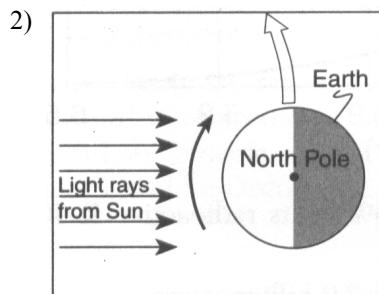
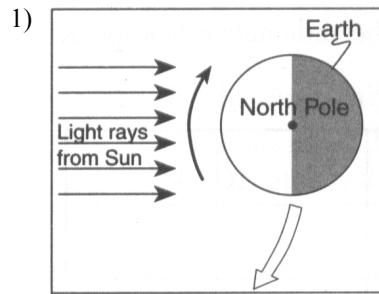
- 1) 1° N 2) 30° N 3) 60° N 4) 90° N

24. Base your answer to the following question on the diagram below, which shows the Moon, Earth, and the Sun's rays as viewed from space. Letter A indicates a certain position of the Moon in its orbit.



Which diagram correctly shows the direction of Earth's rotation and revolution?

Key	
→	Rotation
↔	Revolution



25. The modern heliocentric model of planetary motion states that the planets travel around

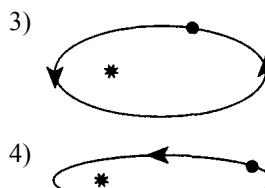
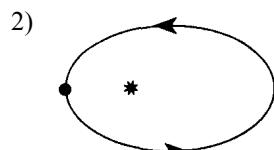
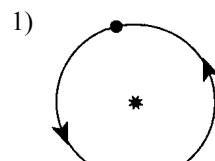
- 1) the Sun in slightly elliptical orbits
- 2) the Sun in circular orbits
- 3) Earth in slightly elliptical orbits
- 4) Earth in circular orbits

26. Which coastal location experiences a cooler summer climate due to ocean currents?

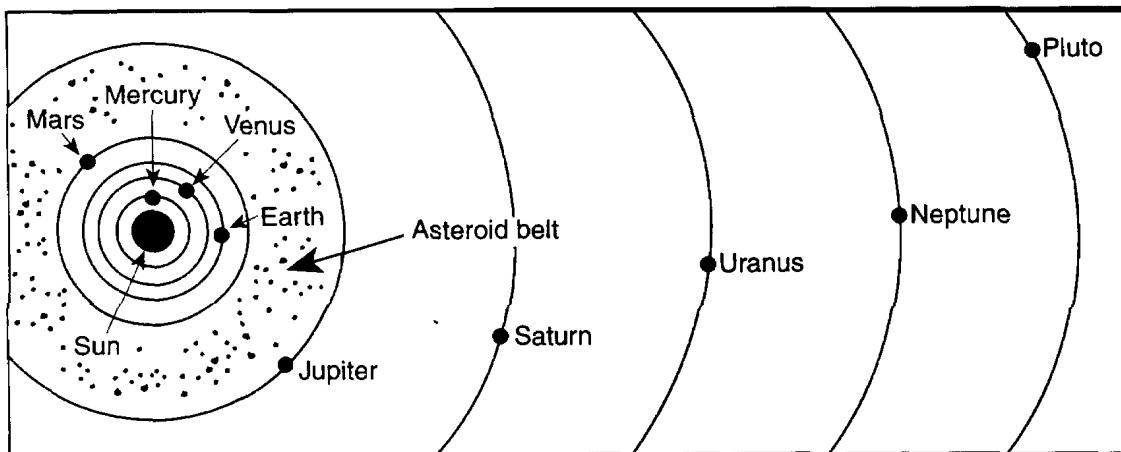
- 1) southeast coast of North America
- 2) northeast coast of Australia
- 3) southwest coast of South America
- 4) northwest coast of Europe

27. Which diagram shows a planet with the *least* eccentric orbit?

(Key: • = planet * = star)



28. Base your answer to the following question on the diagram below, which shows a portion of the solar system.

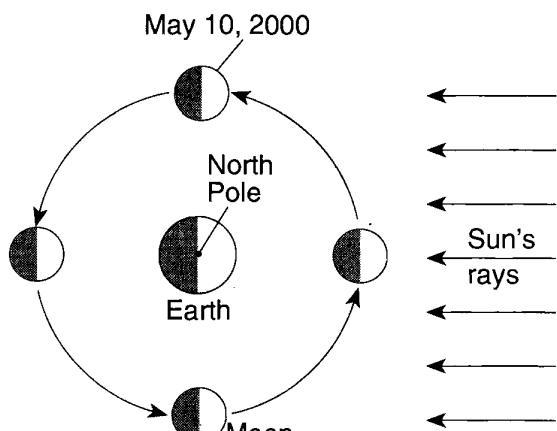


(Not drawn to scale)

The actual orbits of the planets are

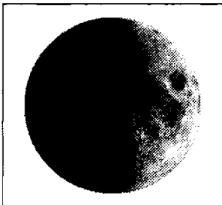
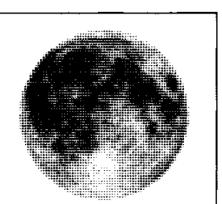
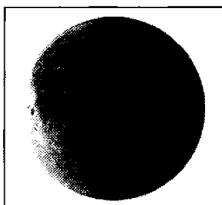
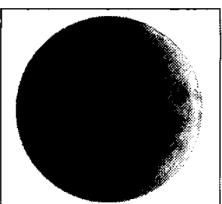
- 1) elliptical, with Earth at one of the foci
2) elliptical, with the Sun at one of the foci
3) circular, with Earth at the center
4) circular, with the Sun at the center

29. The diagram below shows the Moon at four positions in its orbit around Earth as viewed from above the North Pole. The date of one of the four positions has been labeled.



(Not drawn to scale)

Which photograph shows the appearance of the Moon as viewed by an observer in New York State on May 17, 2000?

- 1) 
2) 
3) 
4) 

30. Base your answer to the following question on the data table below and on your knowledge of Earth Science. The data table shows some constellations that can be seen by an observer in New York State during different seasons.

Season	Constellations
spring	Ursa Minor, Orion, Leo, Scorpius
summer	Ursa Minor, Leo, Scorpius, Aquarius
fall	Ursa Minor, Orion, Scorpius, Aquarius
winter	Ursa Minor, Orion, Leo, Aquarius

The diagram below represents a portion of the constellation Ursa Minor is located almost directly



Ursa Minor can be seen by an observer in New York State during all four seasons because Ursa Minor is located almost directly

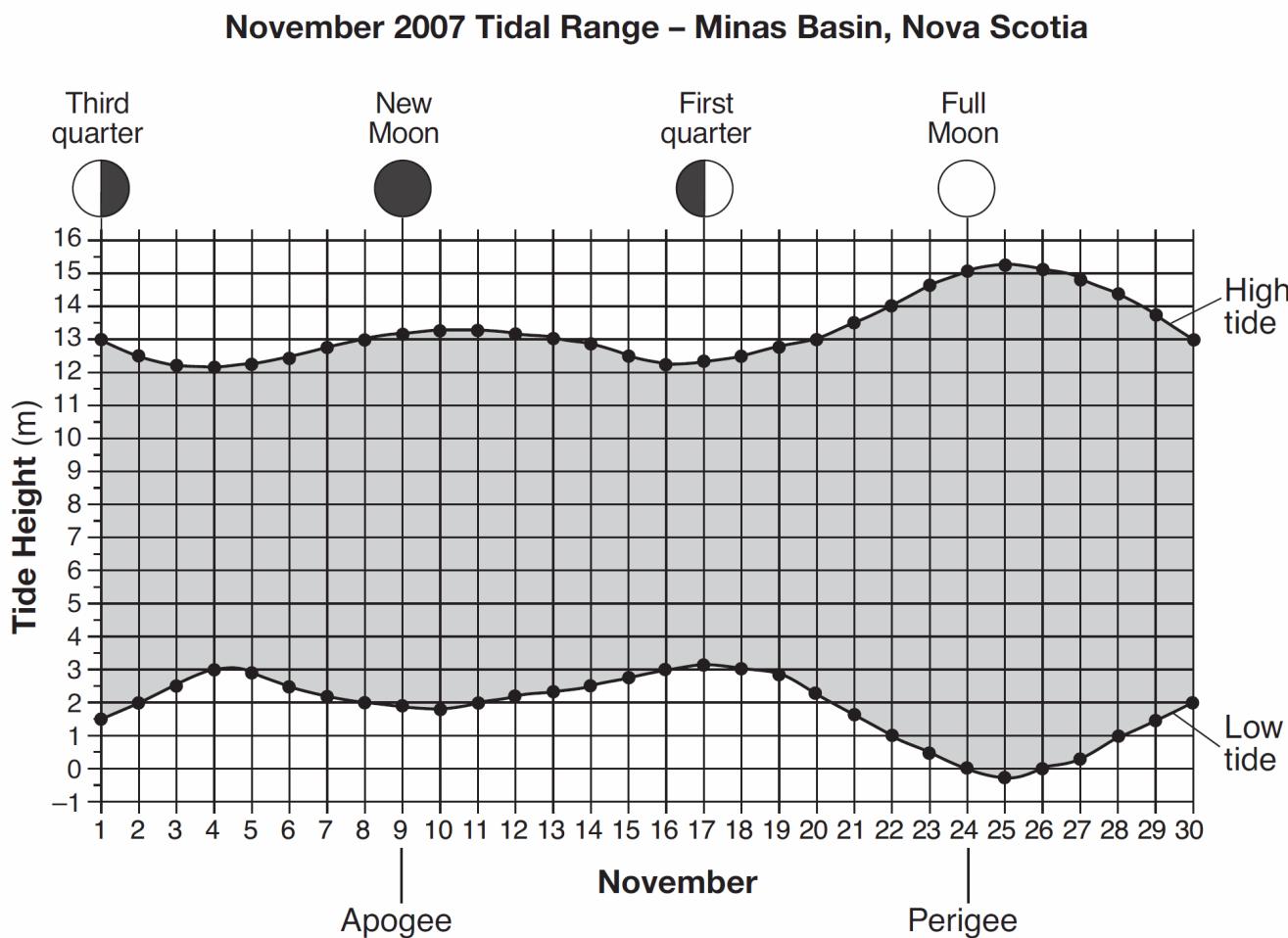
- 1) above Earth's equator
2) above Earth's North Pole
3) overhead in New York State
4) between Earth and the center of the Milky Way

31. Which planetary wind pattern is present in many areas of little rainfall?

- 1) Winds converge and air sinks.
2) Winds converge and air rises.
3) Winds diverge and air sinks.
4) Winds diverge and air rises.

32. Base your answer to the following question on the graph below and on your knowledge of Earth science.

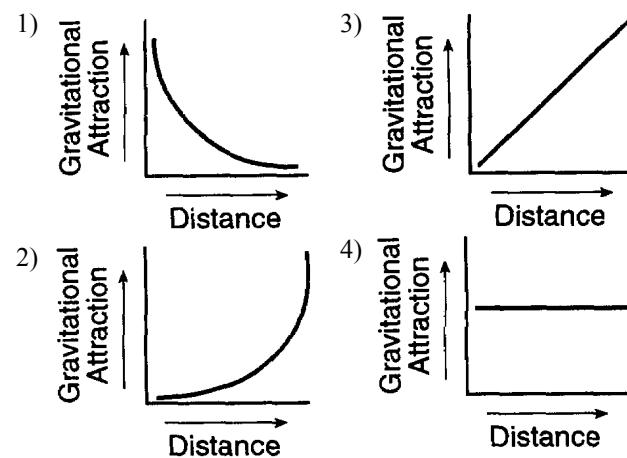
The graph shows the tidal range (the difference between the highest tide and the lowest tide) recorded in Minas Basin, Nova Scotia, during November 2007. The phase of the Moon on selected days is shown above the graph. The dates that the Moon was farthest from Earth (apogee) and closest to Earth (perigee) are indicated under the graph.



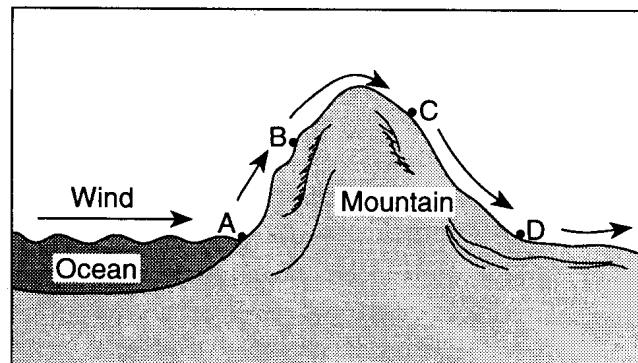
The highest high tides and the lowest low tides occurred when the Moon was near

- 1) apogee and a new-Moon phase
2) apogee and a full-Moon phase
3) perigee and a new-Moon phase
4) perigee and a full-Moon phase

33. Which graph best represents the relationship between the gravitational attraction of two objects and their distance from each other?

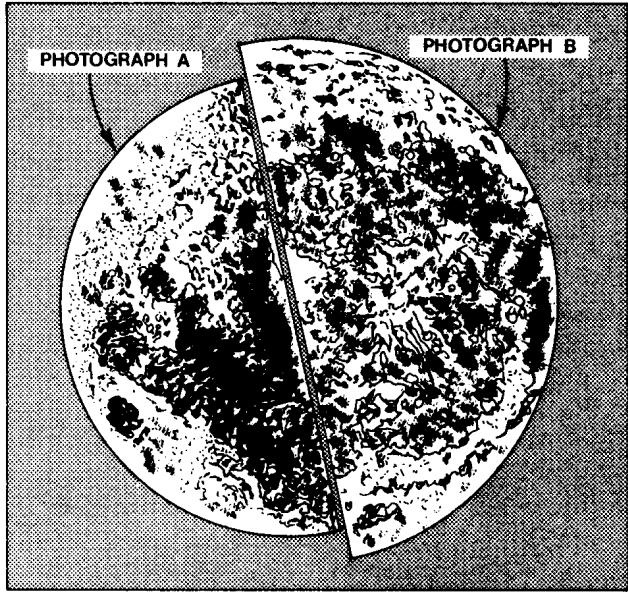


34. Base your answer to the following question on The cross section below shows the flow of prevailing winds over a mountain ridge.



- Which location is most likely to receive precipitation?
1) A 2) B 3) C 4) D

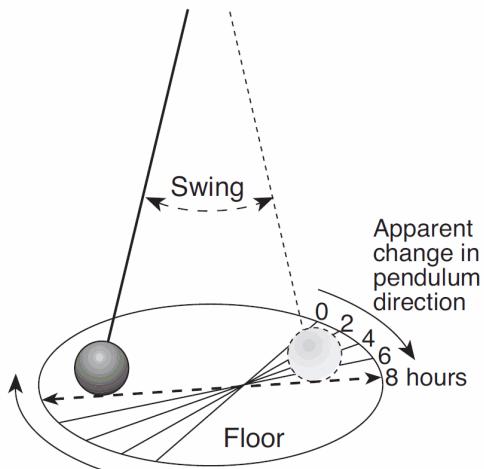
35. The diagram below represents two photographs of the Moon, A and B, taken at full moon phase several months apart. The photographs were taken using the same magnification. Each photograph was cut in half and the halves placed next to each other.



What most likely caused the difference in the apparent size of the Moon in photographs A and B?

- 1) The phases of the Moon changed.
- 2) The Moon expanded.
- 3) The distance from the Earth to the Moon changed.
- 4) The Moon rotated.

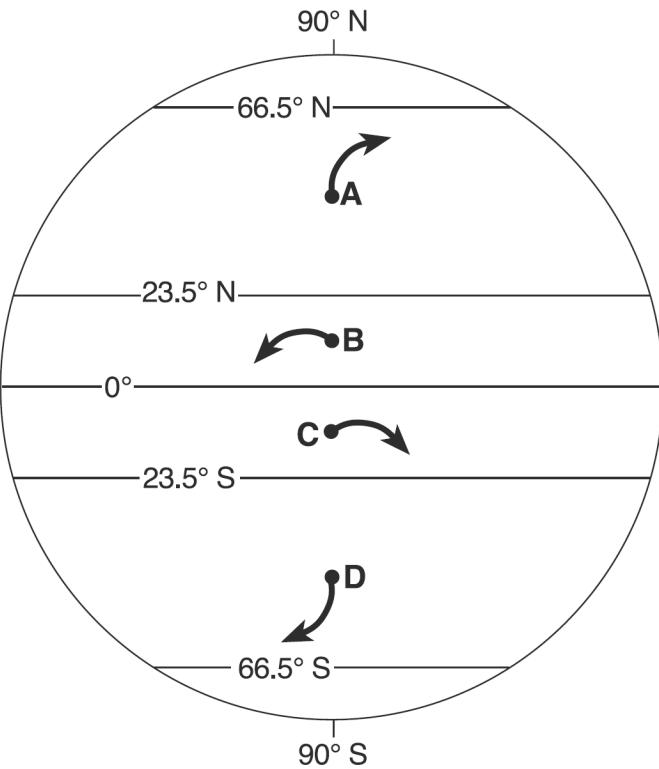
36. The diagram below shows a large pendulum in motion over an 8-hour period.



What is the main reason the pendulum appears to change its direction of swing over time?

- 1) tilt of Earth on its axis
- 2) rotation of Earth on its axis
- 3) revolution of Earth in its orbit
- 4) speed of Earth in its orbit

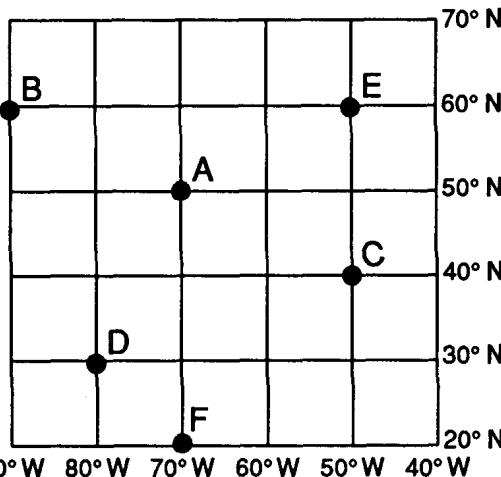
37. The arrows in the diagram below show changes in the direction of surface winds at four lettered locations, A, B, C, and D, on Earth.



The arrow at which location correctly shows a deflection of the wind that could be due to the Coriolis effect?

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

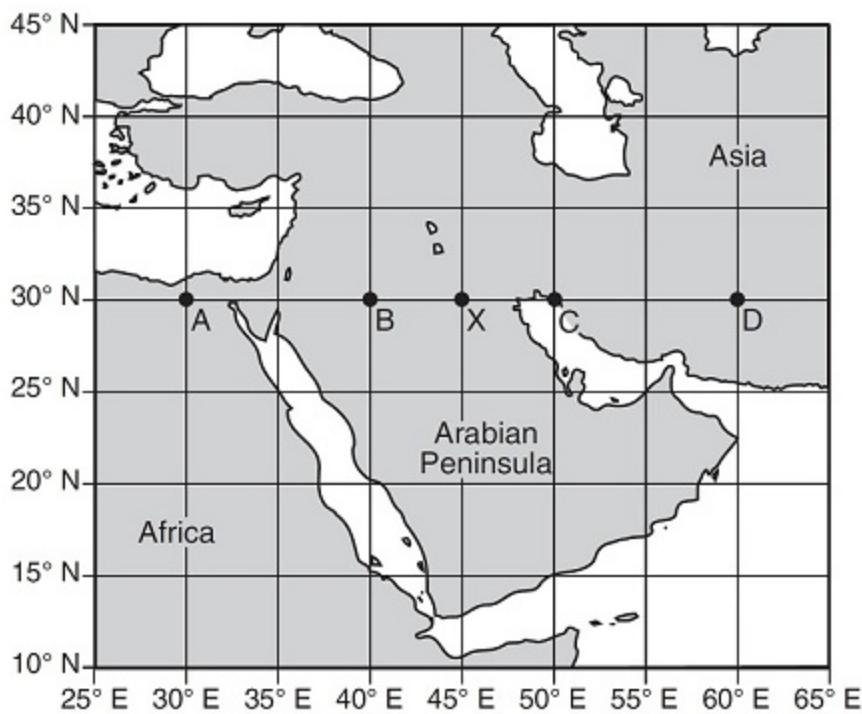
38. Base your answer to the following question on the latitude and longitude system shown below. The map represents a part of the Earth's surface and its latitude-longitude coordinates. Points A through F represent locations in this area.



Points B and E would *not* have the same value for measurements of

- 1) latitude
- 2) time
- 3) duration of solar day
- 4) altitude of the Sun at solar noon

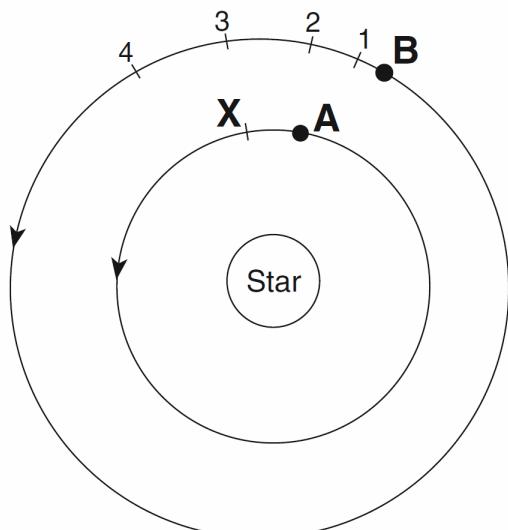
39. The map below shows a portion of the Middle East. Points A, B, C, D, and X are locations on Earth's surface.



When it is 10:00 a.m. solar time at location X, at which location is 11:00 a.m. solar time being observed?

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

40. Base your answer to the following question on the diagram below, which represents the current locations of two planets, A and B, orbiting a star. Letter X indicates a position in the orbit of planet A. Numbers 1 through 4 indicate positions in the orbit of planet B.

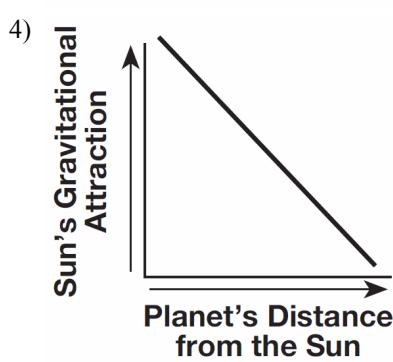
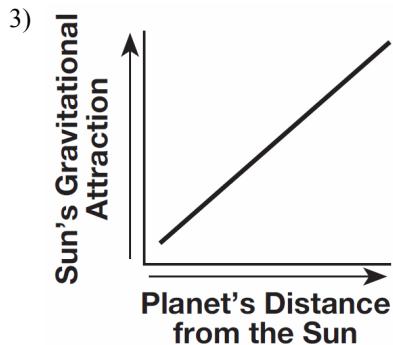
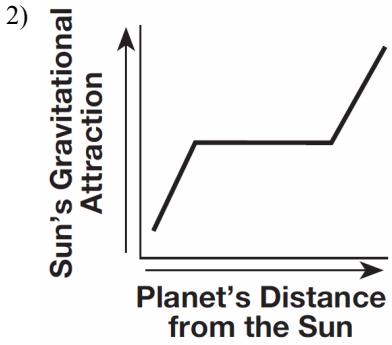
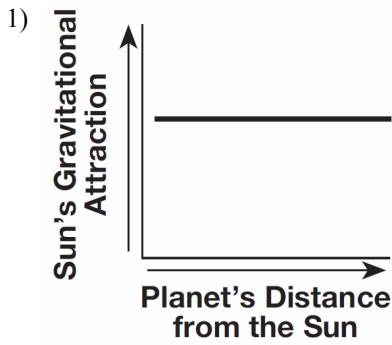


(Not drawn to scale)

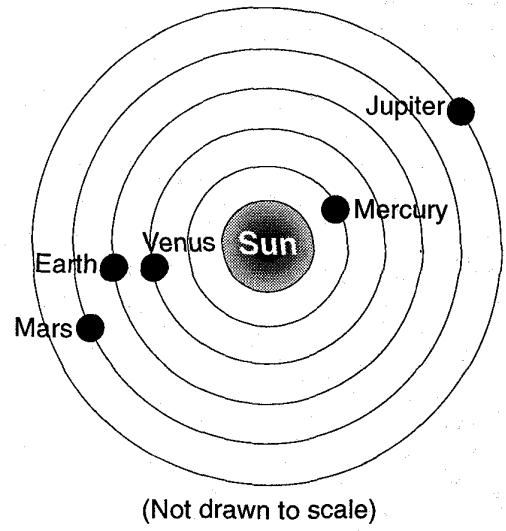
As planet A moves in orbit from its current location to position X, planet B most likely moves in orbit from its current location to position

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

41. Which graph best shows the general relationship between a planet's distance from the Sun and the Sun's gravitational attraction to the planet?



42. The diagram below shows several planets at various positions in their orbits at a particular time.



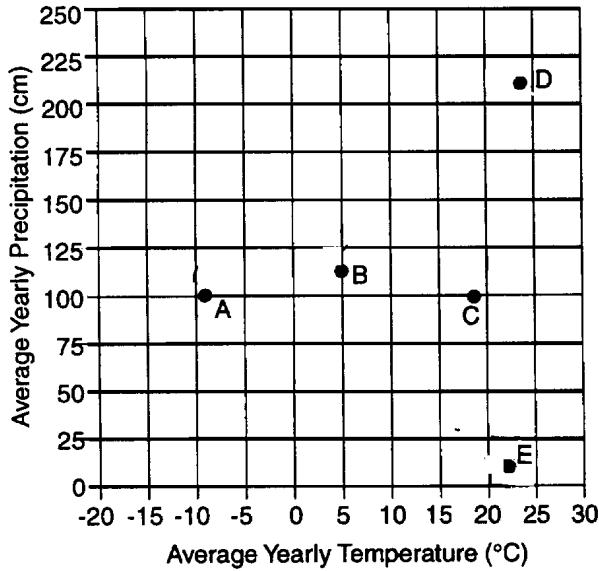
Which planet would be visible from the Earth at night for the longest period of time when the planets are in these positions?

- 1) Mercury 2) Venus 3) Mars 4) Jupiter

43. The planetary wind belts in the troposphere are primarily caused by the

- 1) Earth's rotation and unequal heating of Earth's surface
- 2) Earth's revolution and unequal heating of Earth's surface
- 3) Earth's rotation and Sun's gravitational attraction on Earth's atmosphere
- 4) Earth's revolution and Sun's gravitational attraction on Earth's atmosphere

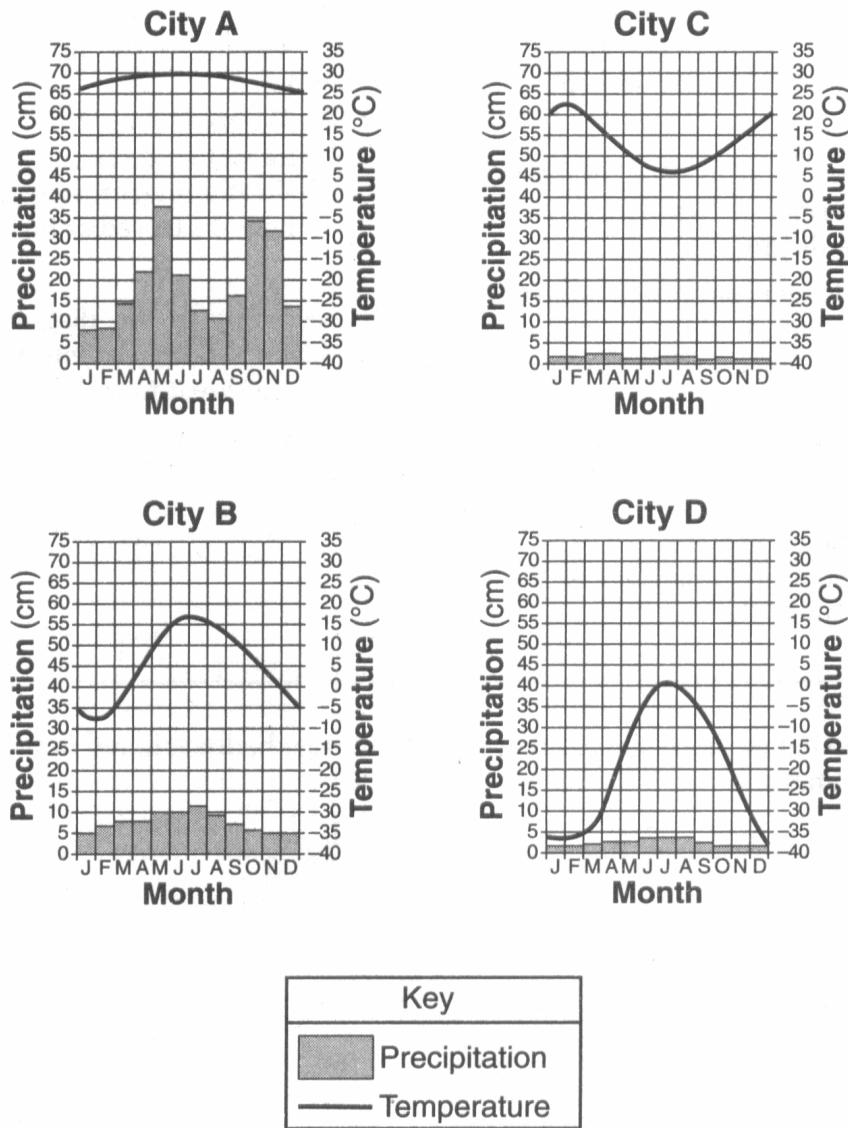
44. Base your answer to the following question on the graph below, which shows the average yearly temperature and average yearly precipitation for Earth locations *A* through *E*.



Locations *A* and *C* have different average yearly temperatures. This difference most likely is due to the fact that

- 1) *A* has a higher elevation
- 2) *A* is located nearer to the Equator
- 3) *C* has more precipitation
- 4) *C* has a greater longitude

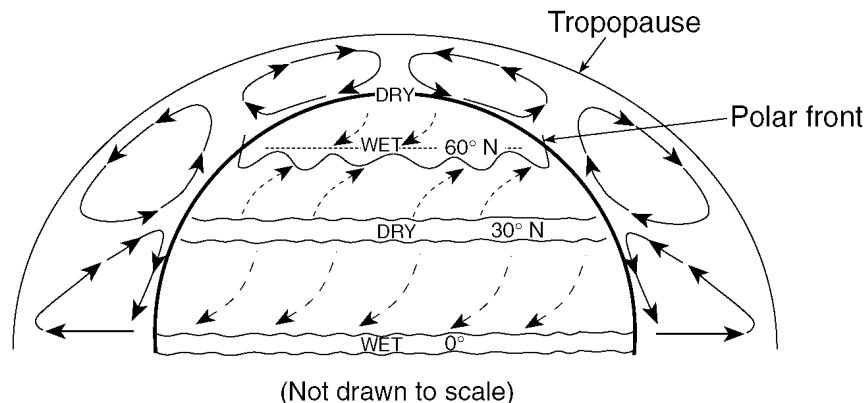
45. Base your answer to the following question on the climate graphs below, which show average monthly precipitation and temperatures at four cities, A, B, C, and D.



During which season does city B usually experience the month with the highest average precipitation?

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

46. Base your answer to the following question on the diagram below, which represents the planetary wind and moisture belts in Earth's Northern Hemisphere.



The paths of the surface planetary winds are curved due to Earth's

- 1) revolution 2) rotation 3) circumference 4) size

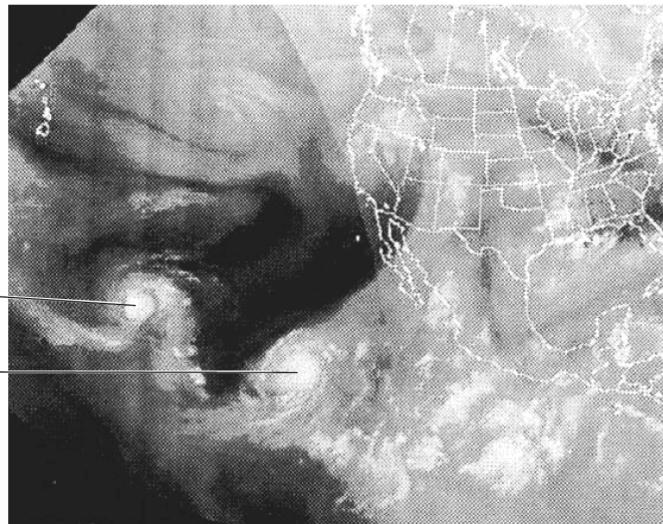
47. The map below shows an eastern portion of North America. Points *A* and *B* represent locations on the eastern shoreline.



Which factor is primarily responsible for location *A* having a lower average yearly temperature than location *B*?

- 1) nearness to a large body of water
- 2) elevation
- 3) latitude
- 4) prevailing winds

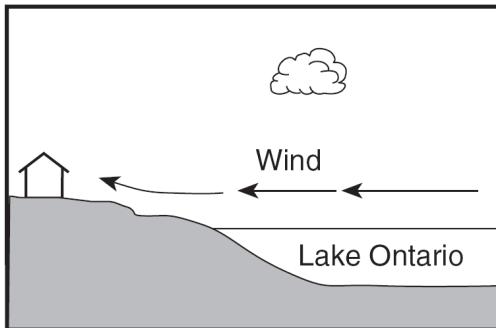
48. The weather satellite image below shows two large swirl-shaped cloud formations, labeled *A* and *B*, over the Pacific Ocean.



These large swirl-shaped cloud formations most likely represent

- 1) polar air masses
- 2) warm fronts
- 3) tornadoes
- 4) hurricanes

49. The cross section below shows a house on the shore of Lake Ontario in August.



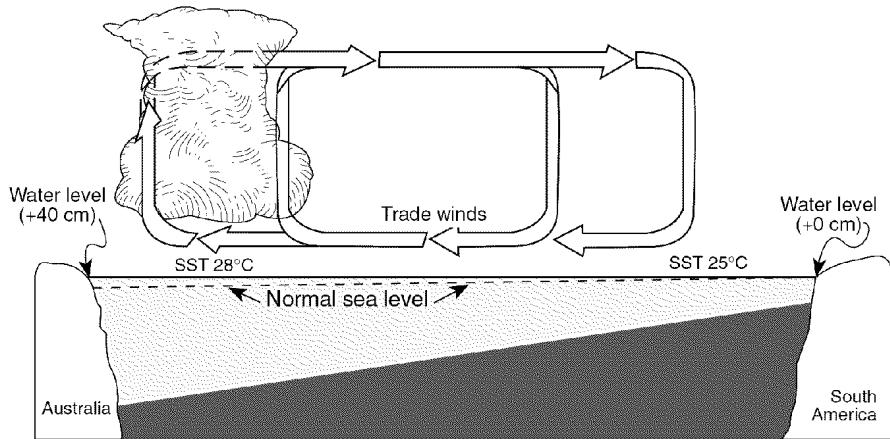
(Not drawn to scale)

Under which conditions would the wind shown in the cross section most likely occur?

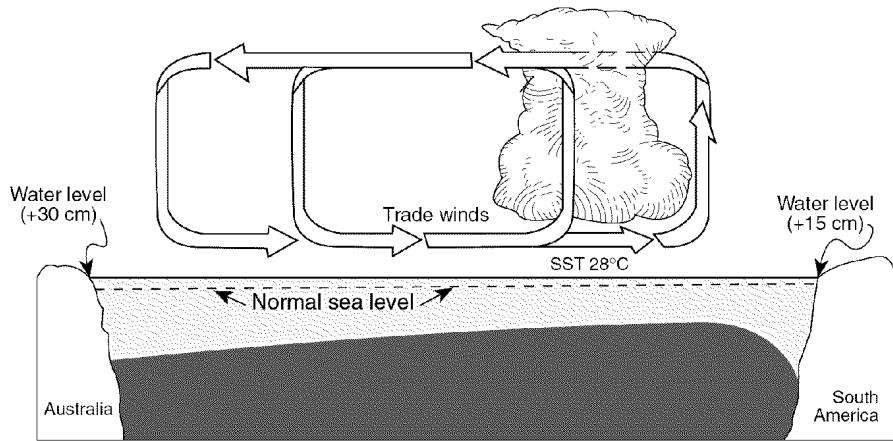
- 1) at 2 a.m., when the air over land is 70°F and the air over the lake is 80°F
- 2) at 6 a.m., when the air over land is 70°F and the air over the lake is 70°F
- 3) at 2 p.m., when the air over land is 80°F and the air over the lake is 70°F
- 4) at 10 p.m., when the air over land is 70°F and the air over the lake is 72°F

50. Base your answer to the following question on the two cross sections below, which represent the Pacific Ocean and the atmosphere near the Equator during normal weather (cross section A) and during El Niño conditions (cross section B). Sea surface temperatures (SST) are labeled and trade-wind directions are shown with arrows. Cloud buildup indicates regions of frequent thunderstorm activity. The change from normal sea level is shown at the side of each diagram.

Cross Section A: Normal Weather



Cross Section B: El Niño Conditions

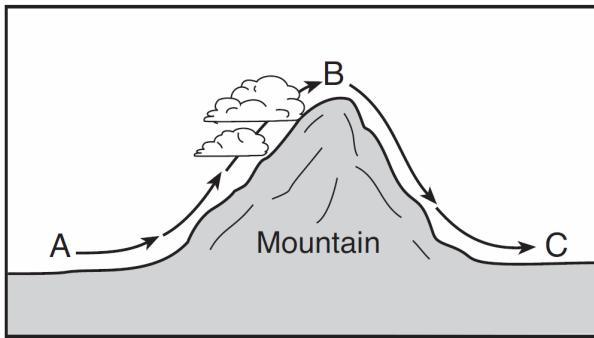


Key		
	Colder ocean water	
	Warmer ocean water	
Frequent thunderstorms	SST	Sea surface temperature

Earth's entire equatorial climate zone is generally a belt around Earth that has

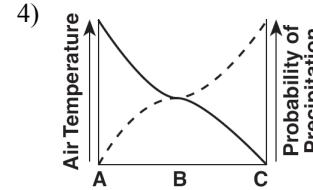
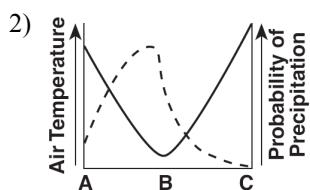
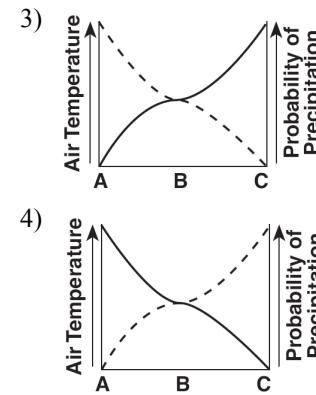
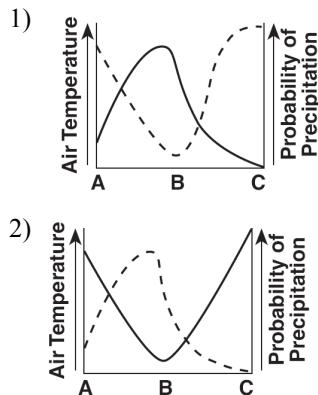
- 1) high air pressure and wet weather
- 2) high air pressure and dry weather
- 3) low air pressure and wet weather
- 4) low air pressure and dry weather

51. The diagram below shows the flow of air over a mountain, from location A to B to C.

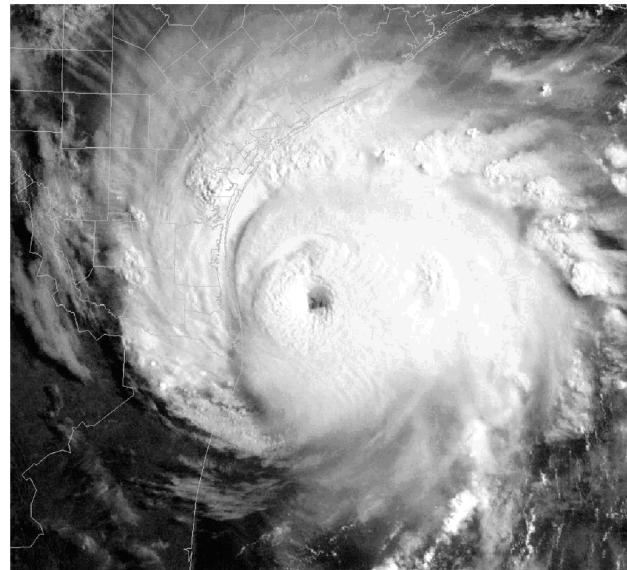


Which graph best shows how the air temperature and probability of precipitation change during this air movement?

Key	
— Air temperature	- - - Probability of precipitation



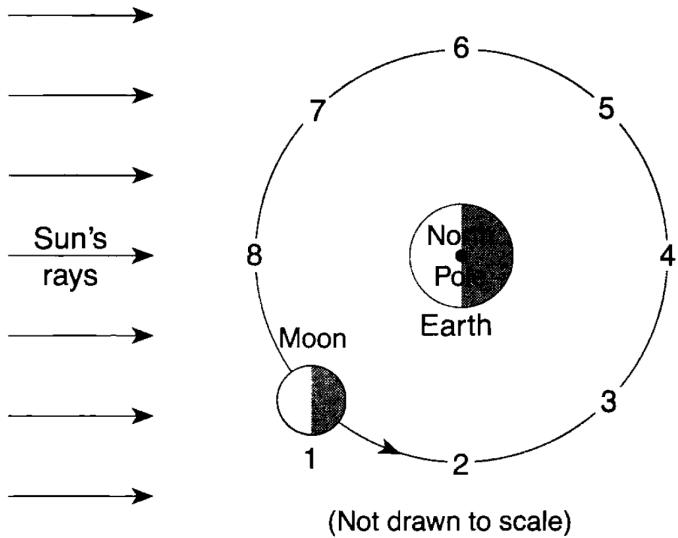
52. Base your answer to the following question on the satellite image below, which shows a Northern Hemisphere hurricane.



When the eye of this hurricane reaches 43° N latitude, this hurricane will most likely be pushed by planetary winds toward the

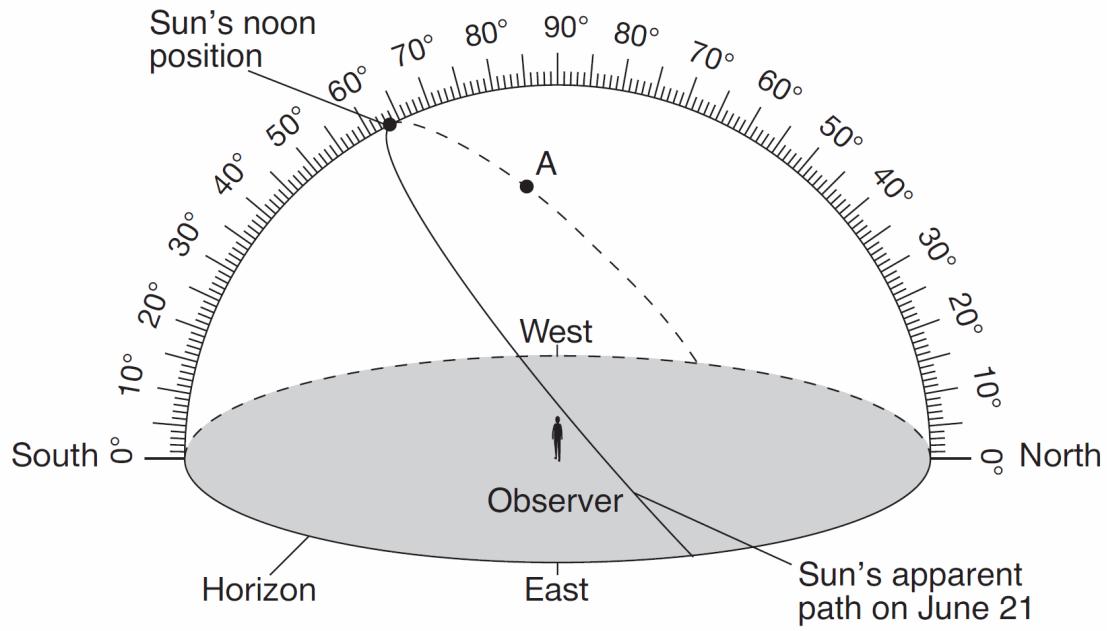
- 1) northwest 2) northeast 3) southwest 4) southeast

53. Base your answer to the following question on the diagram below, which shows the Moon at position 1 in its orbit around Earth. Numbers 2 through 8 represent other positions in the Moon's orbit.



A solar eclipse could occur when the Moon is located at which numbered position?

Base your answers to questions **54** through **56** on the diagram in your answer booklet and on your knowledge of Earth science. The diagram is a model of the sky (celestial sphere) for an observer at 50° N latitude. The Sun's apparent path on June 21 is shown. Point A is a position along the Sun's apparent path. Angular distances above the horizon are indicated.

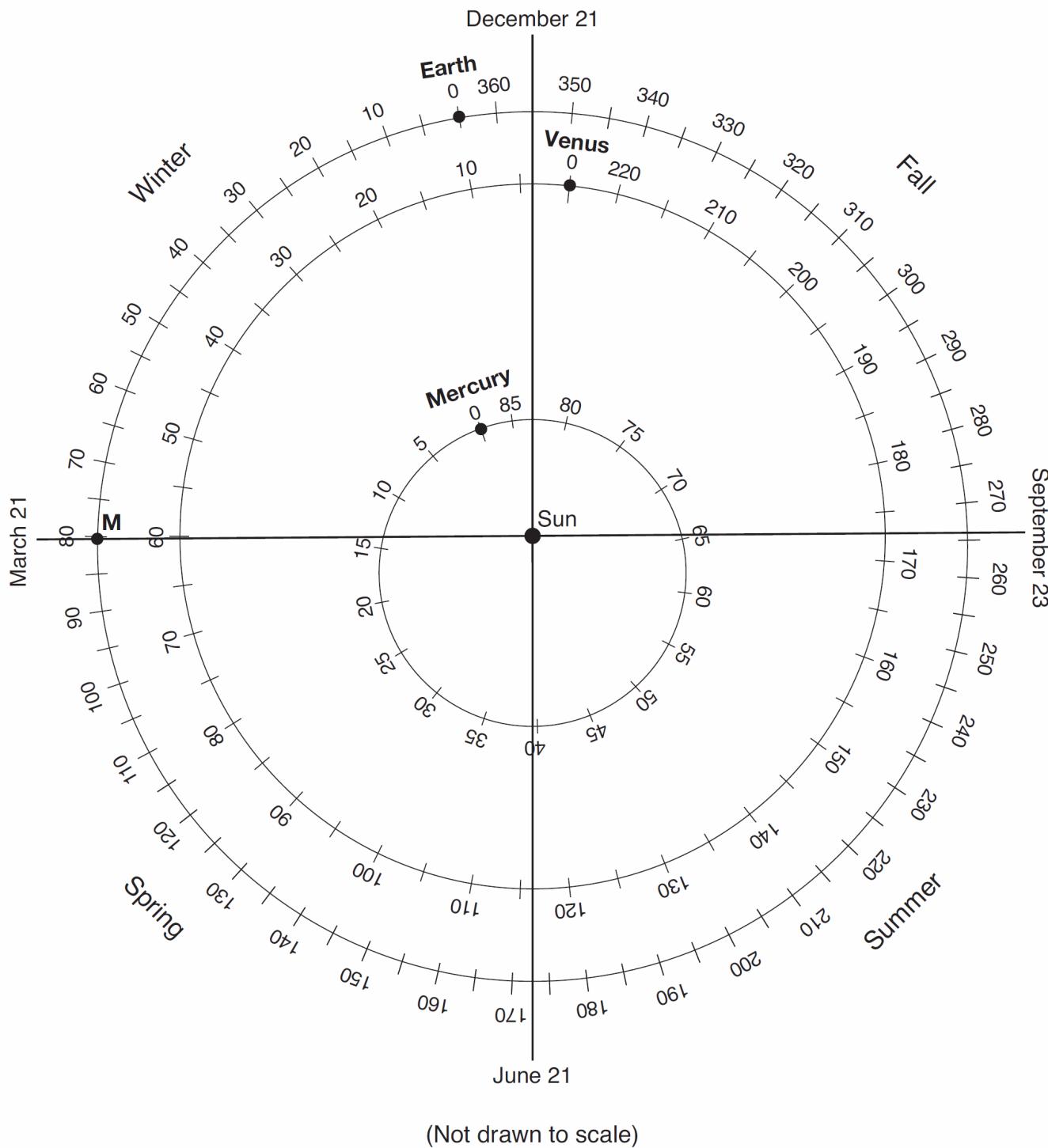


54. Describe the general relationship between the length of the Sun's apparent path and the duration of daylight.

55. The Sun travels 45° in its apparent path between the noon position and point A. Identify the time when the Sun is at point A. Include a.m. or p.m. with your answer.

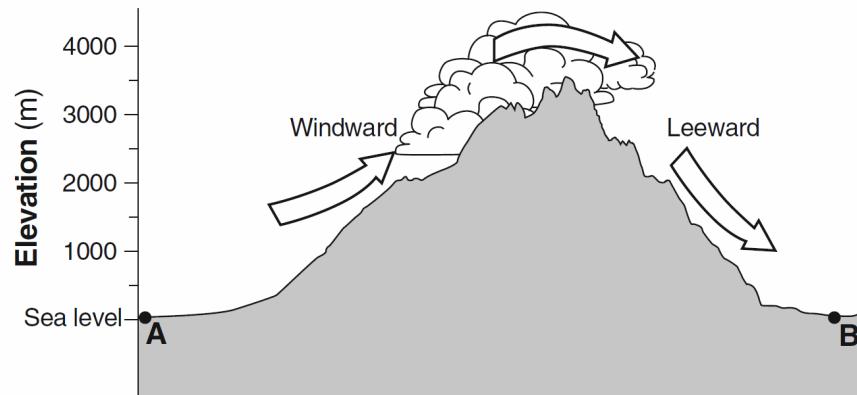
56. On the celestial sphere diagram place an X on the Sun's apparent path on June 21 to show the Sun's position when the observer's shadow would be the longest.

Base your answers to questions **57** through **59** on the diagram in your answer booklet and on your knowledge of Earth science. The diagram represents the orbits of Earth, Venus, and Mercury. Earth, Venus, and Mercury are shown with a dot on each of their orbital paths. The numbers on each orbital path indicate the planet's positions on successive days in its revolution. Point *M* is a position on Earth's orbit. Each season in the Northern Hemisphere on Earth is labeled.



57. What latitude on Earth receives the vertical rays from the Sun when Earth is at position *M*?
58. Approximately how many revolutions does Mercury make around the Sun during one Earth year?
59. On the diagram place an **X** on each planet's orbital path to show the positions of Earth, Venus, and Mercury on the 55th day of *each planet's orbit*.

Base your answers to questions **60** through **63** on the diagram below, which shows the windward and leeward sides of a mountain range. Arrows show the movement of air over a mountain. Points *A* and *B* represent locations at sea level on Earth's surface.



60. Compared to the temperature and relative humidity of the air at point *A*, describe how the temperature and relative humidity of the air are different as the air arrives at point *B*.
61. Explain why air cools as it rises up this mountain.
62. What is the relative humidity at the base (bottom) of the cloud on the windward side of the mountain?
63. Identify *one* weather instrument that could be used to determine the dewpoint of the air at point *A*.

Answer Key

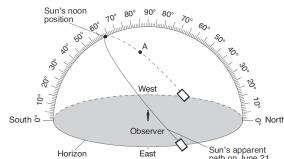
Term 5 Practice

1. 4
2. 1
3. 3
4. 3
5. 3
6. 1
7. 4
8. 4
9. 2
10. 2
11. 2
12. 3
13. 1
14. 3
15. 3
16. 1
17. 4
18. 4
19. 1
20. 3
21. 4
22. 2
23. 4
24. 3
25. 1
26. 3
27. 1
28. 2
29. 2
30. 2
31. 3
32. 4
33. 1
34. 2
35. 3
36. 2
37. 1
38. 2
39. 4
40. 1
41. 4

42. 3
43. 1
44. 1
45. 2
46. 2
47. 3
48. 4
49. 3
50. 3
51. 2
52. 2
53. 8

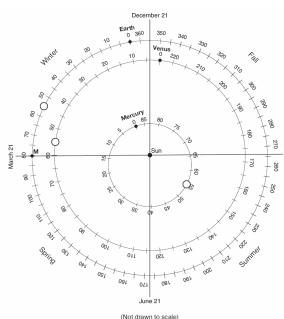
54. – the longer the Sun's path, the longer the duration of daylight, – The shorter the Sun's path, the shorter the daylight will be. – direct relationship
55. – 3 p.m. or 3:00 p.m.

56.



57. – 0° , – equator
58. – 4 revolutions to 4.2 revolutions.

59.



60. Air temperature at B:
–warmer –higher
–increased
Relative humidity at B:
– lower –drier
–decreased

61. – Air expands as it moves up the mountain. – The molecules move farther apart as the air rises. – Lower pressure at higher altitudes allows molecules to move farther apart. – The less dense air at higher altitudes allow the air molecules to spread out.

62. – 100%
63. – psychrometer – wet-and dry-bulb thermometer – hygrometer