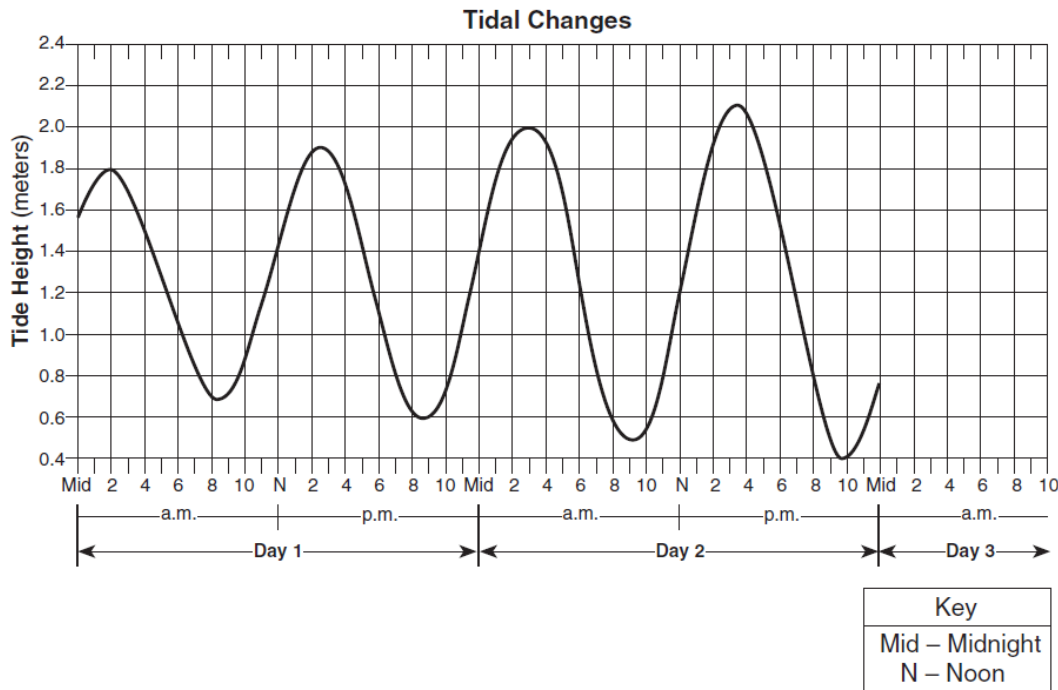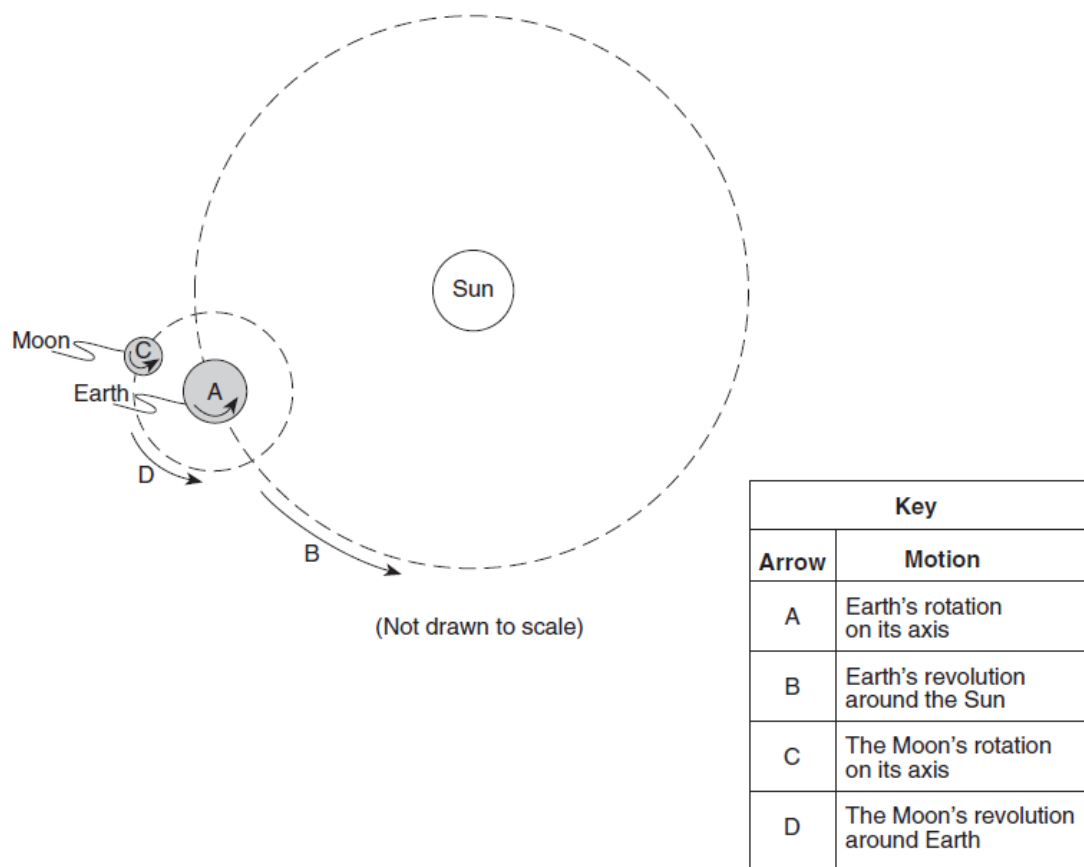**Name** _____

1. Base your answer to the following question on the graph below, which shows two days of tidal data from a coastal location in the northeastern United States.

Tidal Changes

Key
Mid – Midnight
N – Noon

If the pattern shown continues, the most likely height and time for the first high tide on day 3 would be

1) 2.2 meters at 4 a.m.
2) 2.3 meters at 4 a.m.
3) 2.2 meters at 5 a.m.
4) 2.3 meters at 5 a.m.

2. A group of students observed and measured various characteristics of a stream for one day. Which statement about the stream is most likely an inference?

1) The stream water is dark brown.
2) The water level of the stream will rise after the next rainfall.
3) The velocity of the stream is greatest near the outside of a meander.
4) The stream's depth is different at various distances from the streambank.

3. Under the same conditions of temperature and pressure, three different samples of the same uniform substance will have the same

1) shape   **2) density**
3) mass   4) volume

4. The town of Massena, NY is located at approximately

1) 45°55' N 74°05' W   **2) 44°55' N 74°55' W**
3) 74°55' N 44°55' W   4) 74°05' N 44°05' W

5. Compared to the weight of a person at the North Pole, the weight of the same person at the Equator would be

1) slightly less, because the person is farther from the center of Earth
2) slightly less, because the person is closer to the center of Earth
3) slightly more, because the person is farther from the center of Earth
4) slightly more, because the person is closer to the center of Earth

6. Precise measurements of the Earth indicate that its polar diameter is

1) shorter than its equatorial diameter
2) longer than its equatorial diameter
3) the same length as its equatorial diameter

7. 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°

Base your answers to questions **8** through **10** on the diagram below, which has lettered arrows showing the motions of Earth and the Moon.

(Not drawn to scale)

Key	
Arrow	**Motion**
A	Earth's rotation on its axis
B	Earth's revolution around the Sun
C	The Moon's rotation on its axis
D	The Moon's revolution around Earth

8. These lettered arrows represent motions that are

1) noncyclic and unpredictable
2) noncyclic and predictable
3) cyclic and unpredictable
4) cyclic and predictable

9. Which two motions are completed in about the same amount of time?

1) *A* and *B*
2) *B* and *C*
3) *C* and *D*
4) *A* and *D*

10. Which lettered arrow represents the motion that causes the Moon to show phases when view from Earth

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

11. As viewed from Earth, most stars appear to move across the sky each night because

1) Earth revolves around the Sun
2) Earth rotates on its axis
3) stars orbit around Earth
4) stars revolve around the center of the galaxy

12. Compared to terrestrial planets, Jovian planets have

1) smaller equatorial diameters and shorter periods of revolution
2) smaller equatorial diameters and longer periods of revolution
3) larger equatorial diameters and shorter periods of revolution
4) larger equatorial diameters and longer periods of revolution

13. The map below shows four major time zones of the United States. The dashed lines represent meridians of longitude. The locations of New York City and Denver are shown.
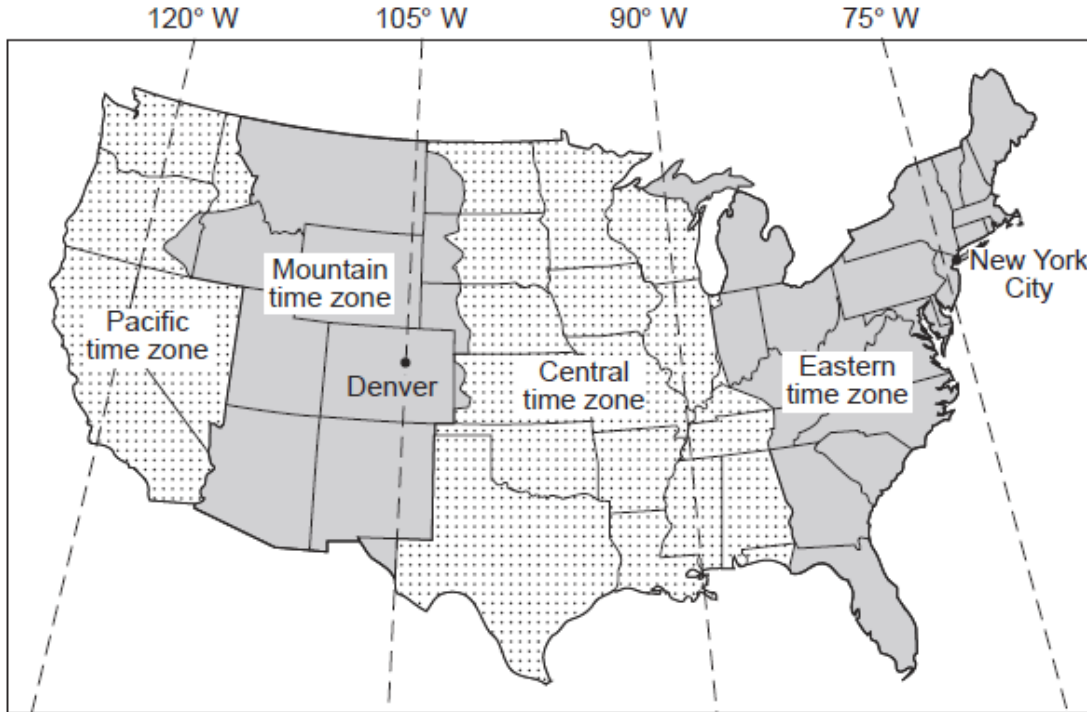
What is the time in New York City when it is noon in Denver?

1) 10 a.m.   **2) 2 p.m.**   3) 3 p.m.   4) noon

14. The diagram below represents an observer measuring the altitude of *Polaris.*
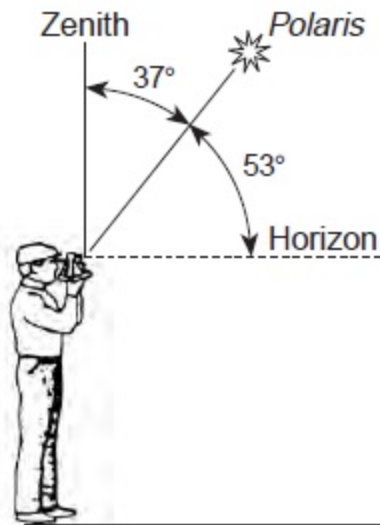
At which latitude is this observer located?

1) 16° N 2) 37° N **3) 53° N** 4) 90° N

15. Which star is more massive than our Sun, but has a lower surface temperature?

1) *40 Eridani B*   2) *Sirius*
3) *Aldebaran*   4) *Barnard's Star*

16. The model below shows the Sun's apparent path across the sky for an observer in New York State.
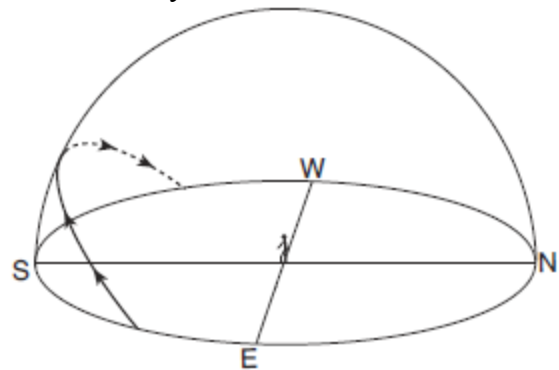
On which day of the year was this path observed?

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

17. A major piece of evidence supporting the Big Bang theory is the observation that wavelengths of light from stars in distant galaxies show a

1) redshift, appearing to be shorter
2) redshift, appearing to be longer
3) blueshift, appearing to be shorter
4) blueshift, appearing to be longer
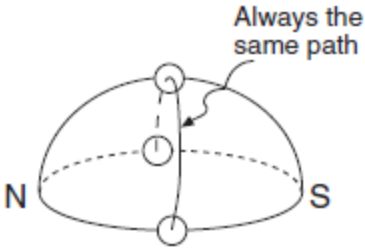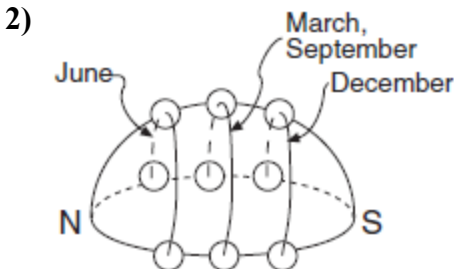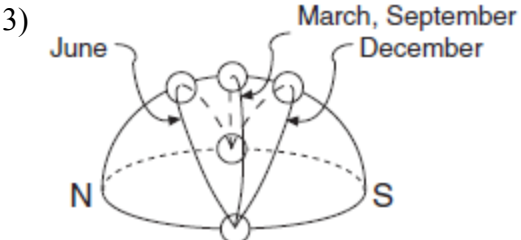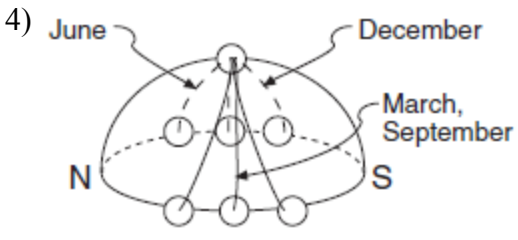
18. The map below shows a portion of Earth's system of latitude and longitude and five surface locations labeled *A*, *B*, *C*, *D*, and *X*.
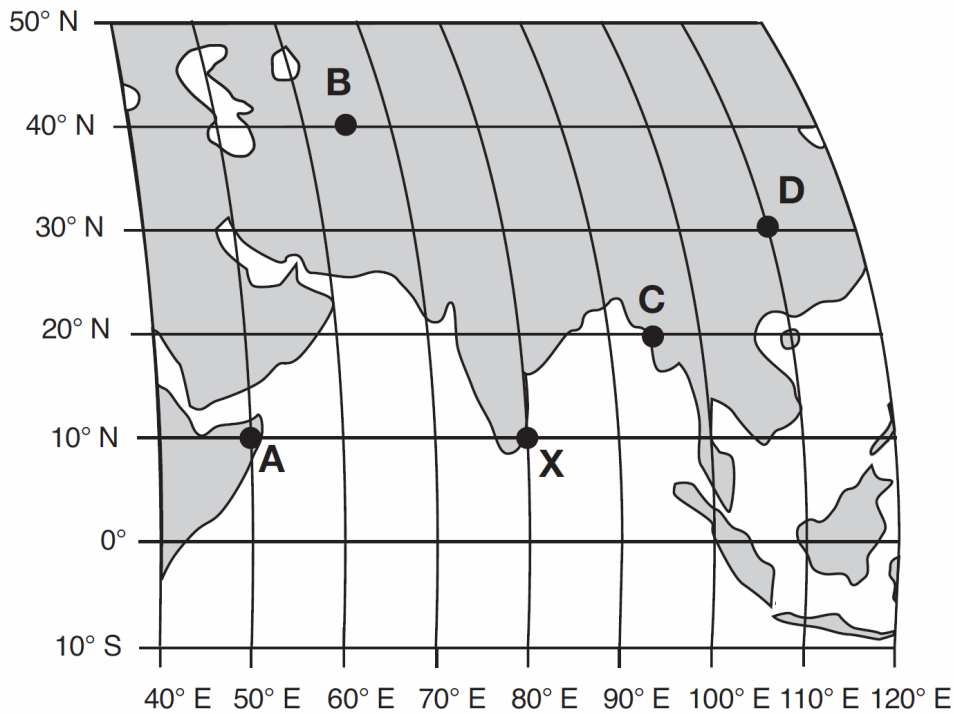
It is solar noon at location *X*. At which location will solar noon next occur?

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

19. Which model best represents the apparent path of the Sun observed at various times during the year at the Equator?

20. Base your answer to the following question on the time-exposure photograph shown below. The photograph was taken by aiming a camera at a portion of the night sky above a New York State location and leaving the camera's shutter open for a period of time to record star trails.
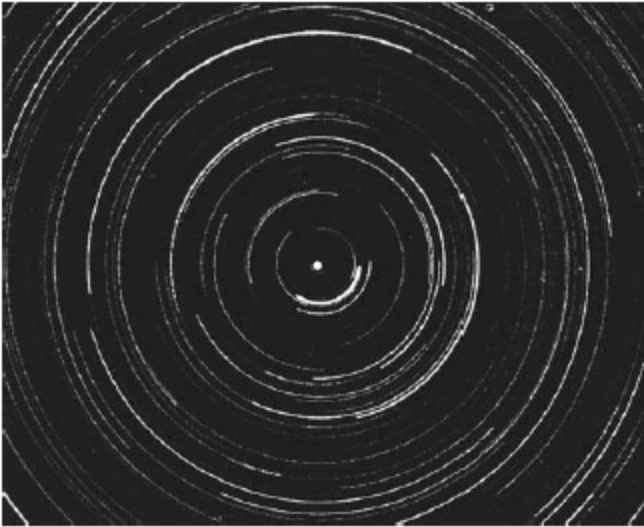
During the time exposure of the photograph, the stars appear to have moved through an arc of 120°. How many hours did this time exposure take?

1) 5 h   **2) 8 h**   3) 12 h   4) 15 h

21. The diagram below shows the altitude of the Sun at solar noon on March 21, as seen by an observer at 42° N latitude.
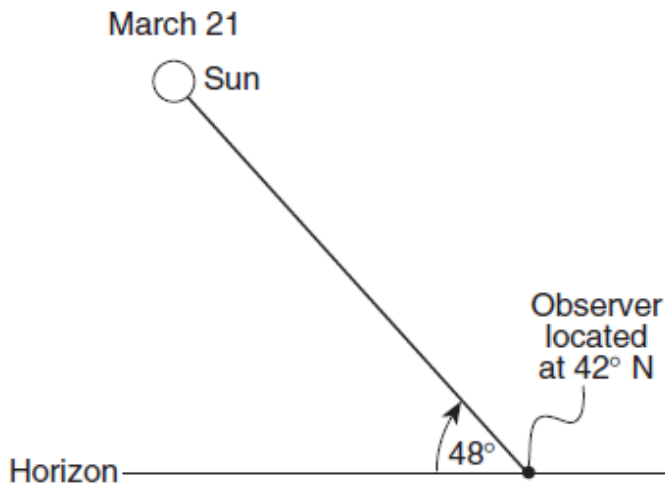
Compared to the altitude of the Sun observed at solar noon on March 21, the altitude of the Sun observed at solar noon on June 21 will be

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

Base your answers to questions **22** and **23** 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.
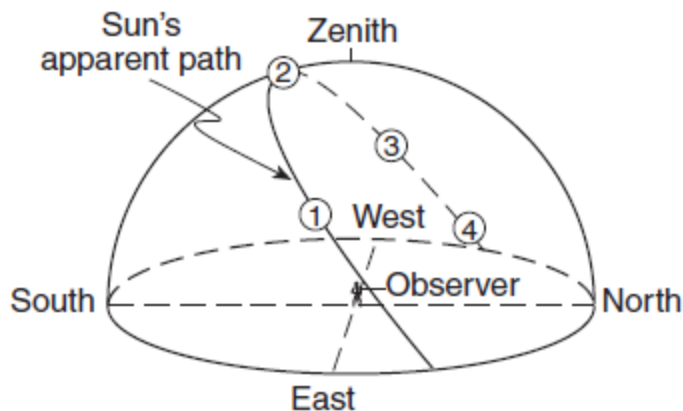
22. During which day of the year is the Sun most likely to follow the apparent path shown?

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

23. The observer had the longest shadow when the Sun was at position

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

24. The diagram below represents Earth and the Moon as viewed from above the North Pole. Points *A, B, C,* and *D* are locations on Earth's surface.

(Not drawn to scale)
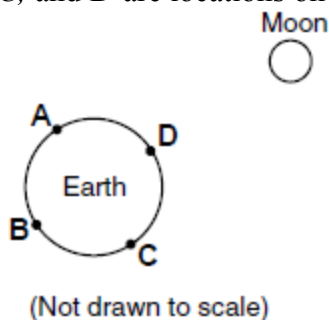
According to the diagram, where will high ocean tides and low ocean tides most likely be located?

1) High tides at *A* and *B*; low tides at *C* and *D*
2) high tides at *B* and *D*; low tides at *A* and *C*
3) high tides at *A* and *C*; low tides at *B* and *D*
4) high tides at *C* and *D*; low tides at *A* and *B*

25. The topographic map below shows a hill. Points *X* and *Y* represent locations on the hill's surface. Elevations are shown in meters.
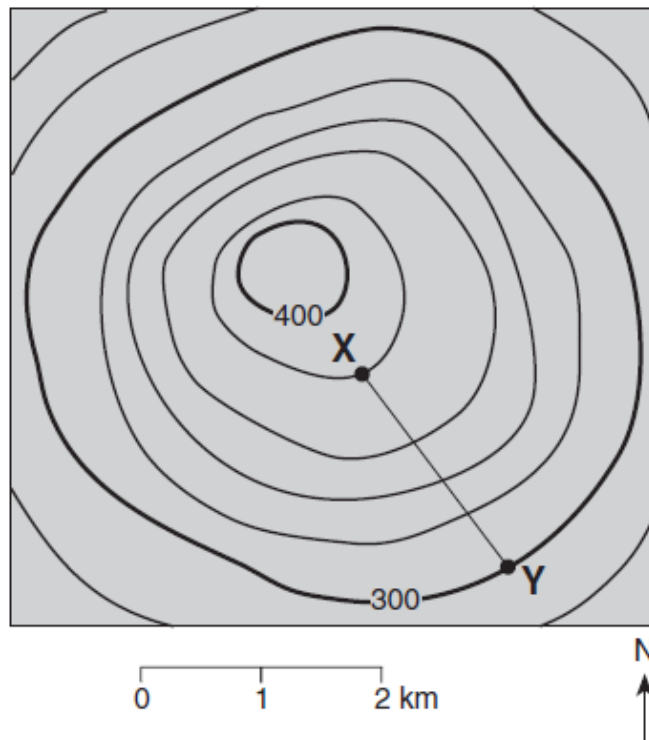
What is the gradient between points *X* and *Y*?

1) 40 m/km 2) 80 m/km
3) 100 m/km 4) 120 m/km

26. 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

27. The contour map below shows a lake and river system. The Birch and Elk Rivers carry an equal volume of water.
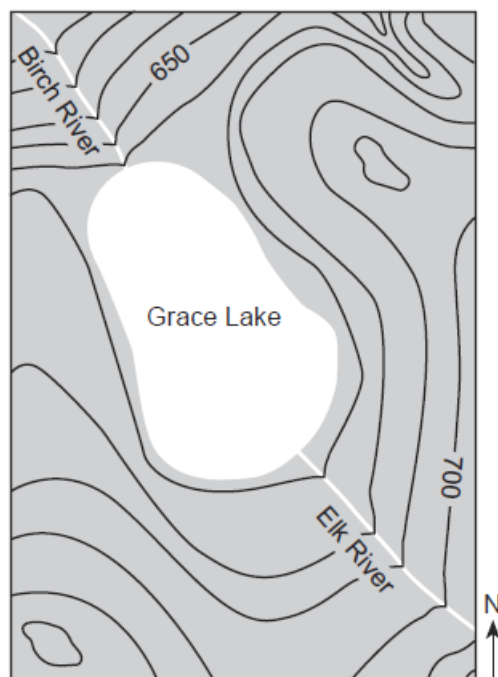
Compared to the Elk River, the Birch River can best be described as flowing

1) **faster, and in the same general compass direction**

2) faster, and in the opposite general compass direction
3) slower, and in the same general compass direction
4) slower, and in the opposite general compass direction

28. Energy is transferred from *Barnard's Star* to Earth mainly by

1) red shifts
2) density currents
3) conduction
4) **electromagnetic waves**

29. The diagram below represents the apparent changes in the direction of swing of a Foucault pendulum.
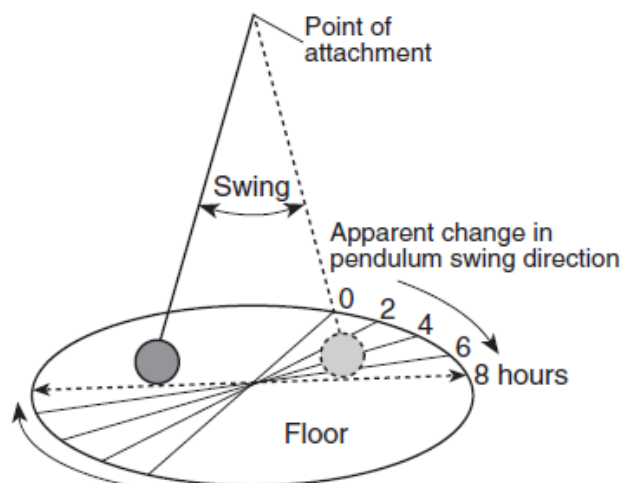
This apparent change in direction of swing provides evidence that Earth

1) has a spherical shape
2) is tilted on its axis
3) orbits around the Sun
4) **turns on its axis**

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

Key
⟶ Original direction of wind
⟶ Deflected path of wind

31. Base your answer to the following question on the topographic map below. Points *A*, *X*, and *Y* are reference points on the map.
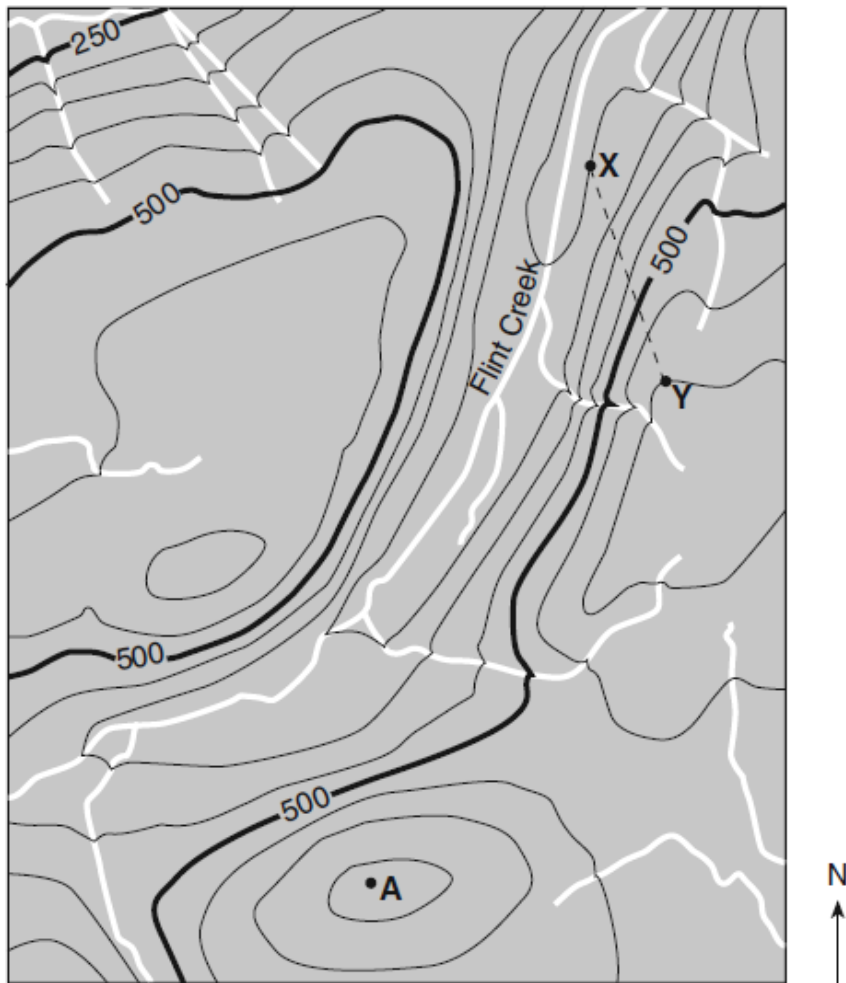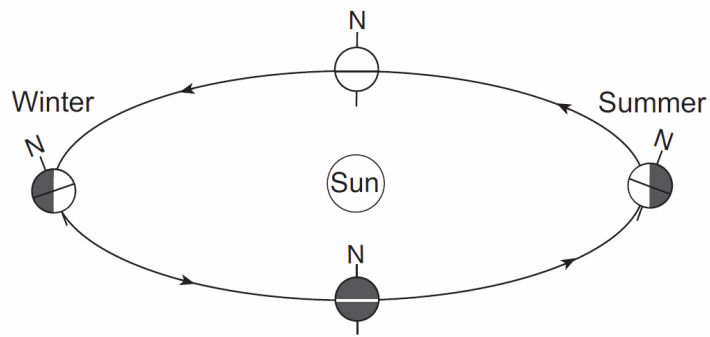

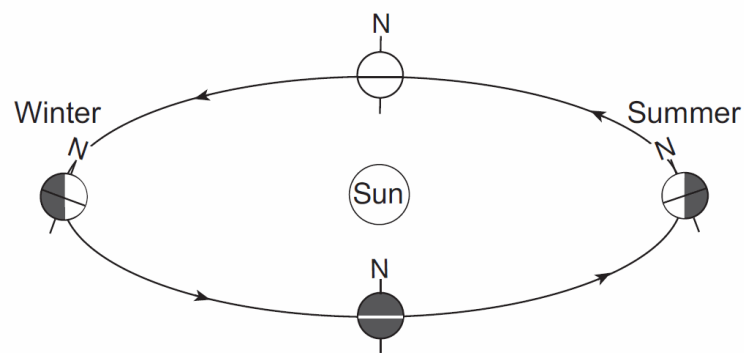Contour interval = 50 meters
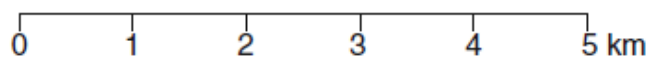
What is a possible elevation of point *A?*

1) 575 meters   2) 600 meters   **3) 655 meters**   4) 710 meters

32. Which diagram best represents the tilt of Earth's axis that causes the Northern Hemisphere seasons shown? (Diagrams are not drawn to scale.)
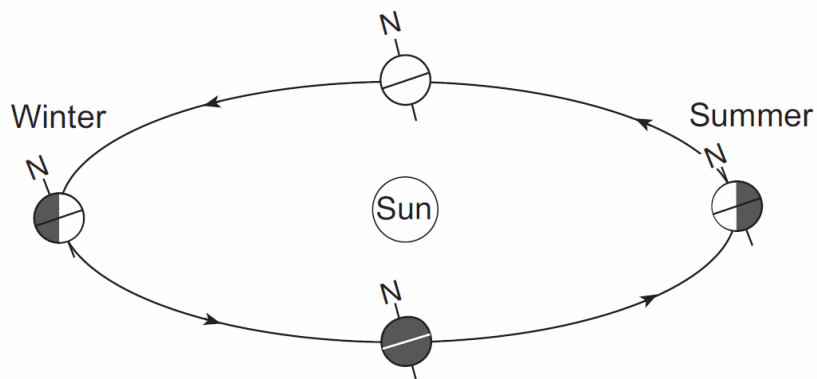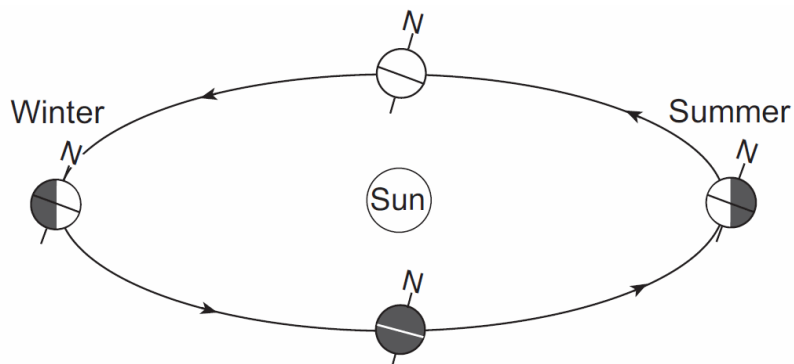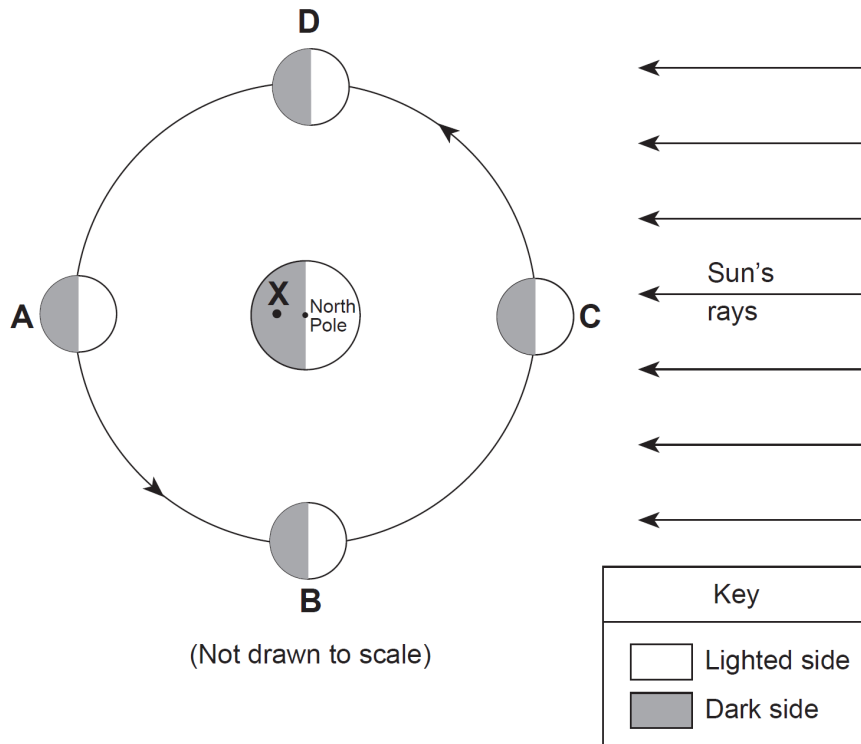
1)

2)

3)

4)

33. 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.

D

A

X
North
Pole

C

Sun's
rays

B

(Not drawn to scale)

Key	
☐	Lighted side
▨	Dark side

On what date does the line separating day and night pass through Earth's North Pole, as shown in this diagram?

1) December 21   2) January 21   **3) March 21**   4) June 21

34. Base your answer to the following question on the map below, which shows locations *A* and *B* on Earth's surface at the same distance from the ocean, at the same elevation above sea level, and at the same latitude.

A

B
Europe

North
America

Africa

South
America
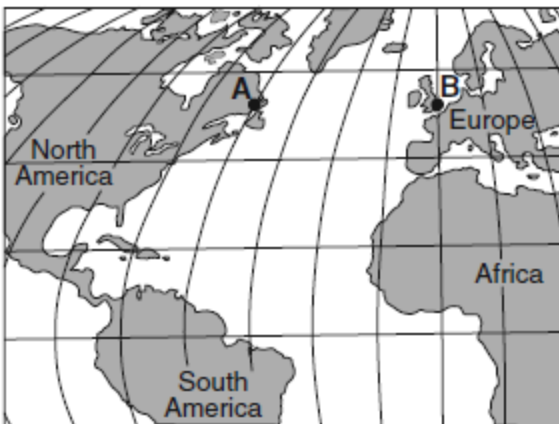
There is a four-hour solar time difference between locations *A* and *B*. What is the difference in longitude between locations *A* and *B*?
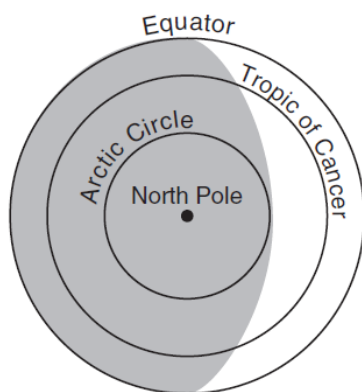
1) 15°   2) 23.5°   3) 45°   **4) 60°**

Base your answers to questions **35** and **36** on the diagram below, which shows a model of Earth's orbit around the Sun. Letters *A*, *B*, *C*, and *D* represent Earth's position at the beginning of each season.
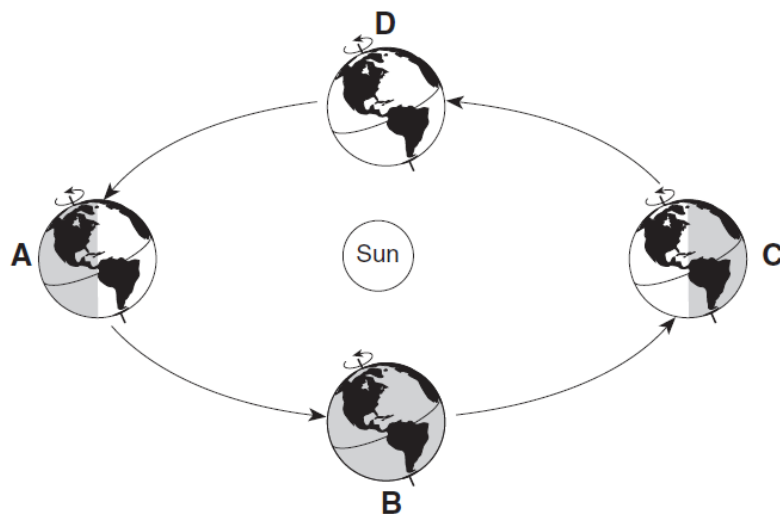
(Not drawn to scale)

35. The diagram below shows how Earth is illuminated [lighted] by the Sun as viewed from above the North Pole.

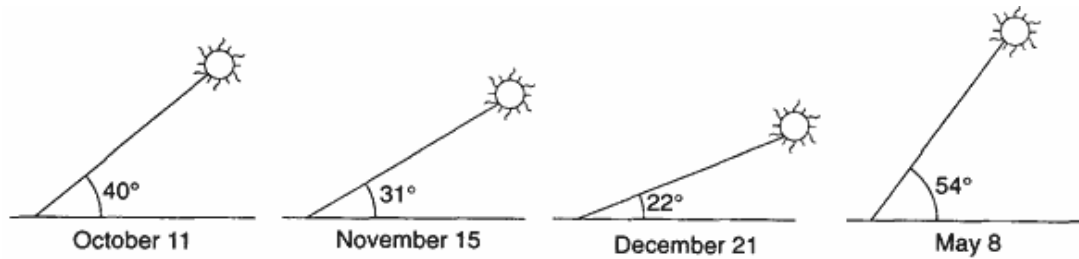In which orbital position would Earth be illuminated as shown?

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

36. Which position of Earth represents the first day of summer in the Northern Hemisphere?

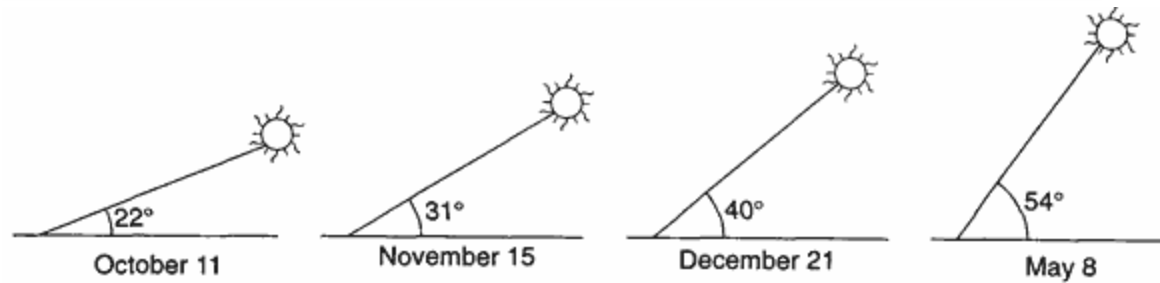1) *A*   2) *B*   **3)** *C*   4) *D*

37. A student accurately measured the altitude of the noontime Sun from the same New Jersey location on four days during the school year. Which sequence best shows these measurements?
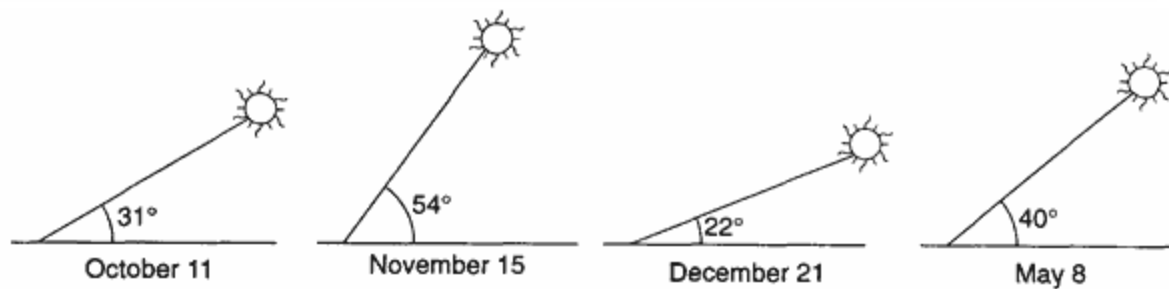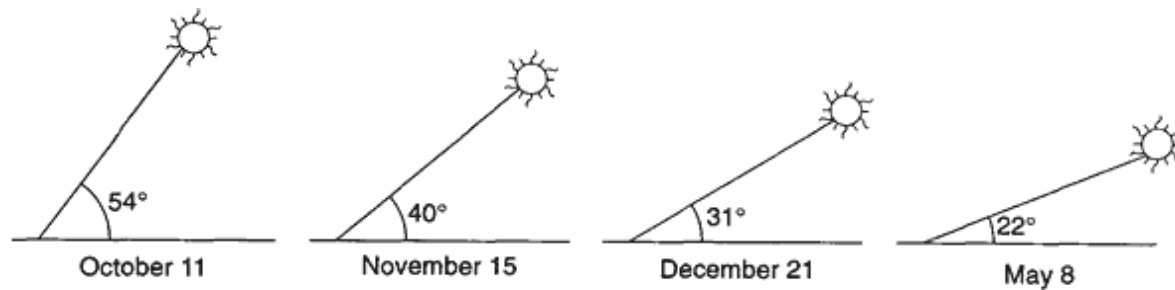
1)

| 40° | 31° | 22° | 54° |
| October 11 | November 15 | December 21 | May 8 |

2)

| 22° | 31° | 40° | 54° |
| October 11 | November 15 | December 21 | May 8 |

3)

| 31° | 54° | 22° | 40° |
| October 11 | November 15 | December 21 | May 8 |

4)

| 54° | 40° | 31° | 22° |
| October 11 | November 15 | December 21 | May 8 |

Base your answers to questions **38** and **39** on the diagram below and on your knowledge of Earth science. The diagram represents the Moon at different positions, labeled *A, B, C*, and *D*, in its orbit around Earth.
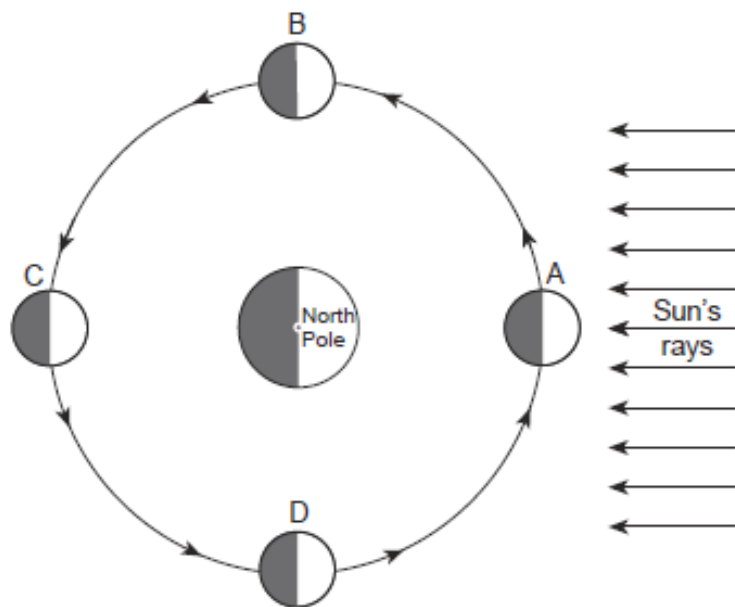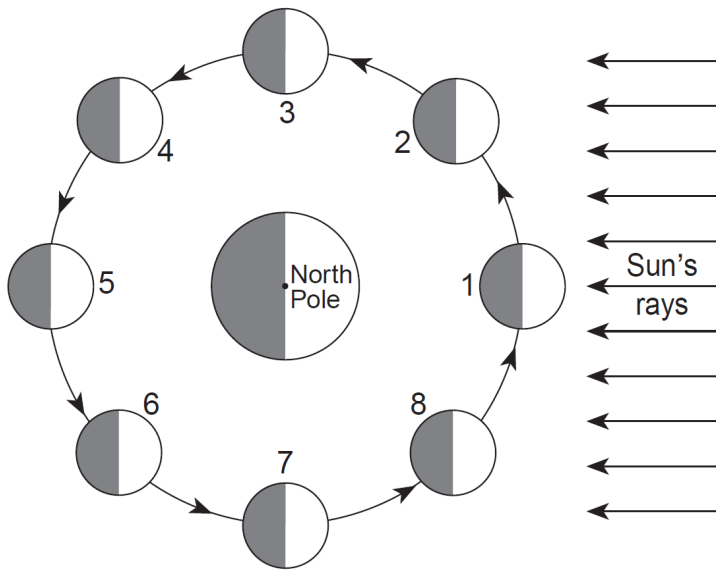

(Not drawn to scale)

38. During which Moon phase could an observer on Earth see a lunar eclipse occur?

1) 2) 3) 4)

39. At which two Moon positions would an observer on Earth most likely experience the highest high tides and the lowest low tides?

1) *A* and *B*   2) *B* and *C*   **3) *C* and *A***   4) *D* and *B*

40. Base your answer to the following question on the diagram below and on your knowledge of Earth science. The diagram represents eight numbered positions of the Moon in its orbit around Earth.


(Not drawn to scale)

Which two motions cause the Moon to show a complete cycle of phases each month when viewed from New York State?

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

41. The graph below shows the general relationship between latitude and the duration of insolation on a particular day of the year.
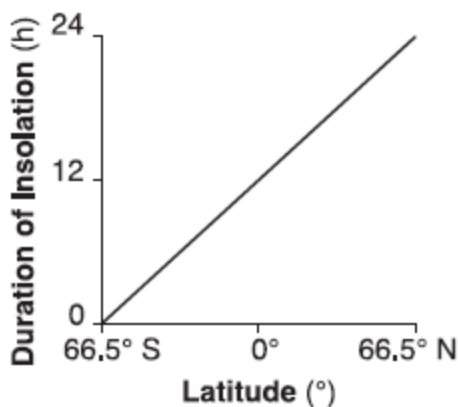
Which date is represented by the graph?

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

Base your answers to questions **42** and **43** on the diagram below and on your knowledge of Earth science. The diagram represents the Moon in eight positions, *A* through *H*, in its orbit around Earth.

(Not drawn to scale)
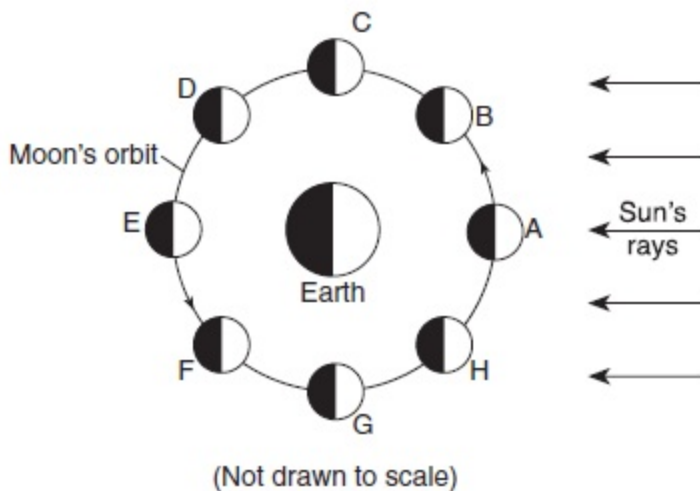
42. Which Moon phase is observed in New York State when the Moon is located at position *F*?

1)

2)

3)

4)

43. How many days are required for the Moon to complete a cycle of phases from the new Moon position represented in the diagram to the new Moon the following month?

1) 2.2 d   2) 27.3 d   **3) 29.5 d**   4) 365.26 d

44. The photographs below show the same coastal location at two different times during the same day.


People on Beach
12:40 p.m.

People Boating
**6:52 p.m.**

Source: thehopewellrocks.ca (adapted)

Which statement best explains the cause for the higher water level at 6:52 p.m.?

1) The Moon rotates on its axis at the same rate that it revolves around Earth.
2) The Moon exerts a gravitational pull on a rotating Earth.
3) Earth's rotation causes a deflection of surface ocean currents.
4) Earth's tilted axis causes different amounts of insolation throughout the day.

45. The diagrams below represent constellations seen by an observer in New York State facing south at midnight on July 7 and January 3.
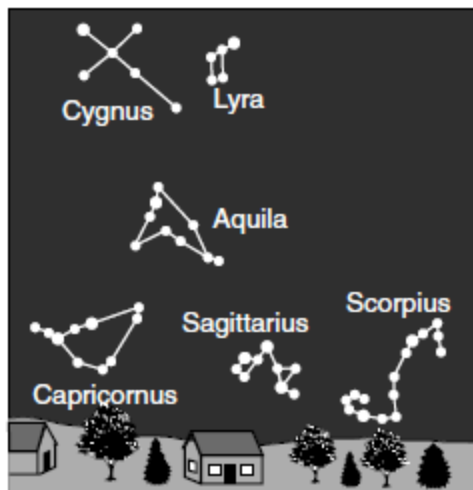
Southern horizon – July 7
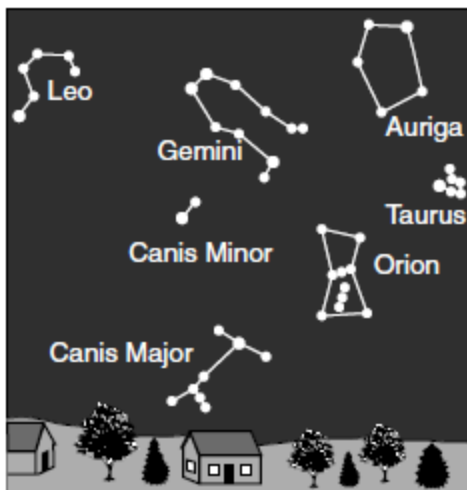
Southern horizon – January 3

Which motion causes the observer to see different constellations at midnight on July 7 compared to midnight on January 3?

1) revolution of the constellations in their orbits
2) revolution of Earth in its orbit
3) rotation of the stars in the constellations
4) rotation of Earth on its axis

46. Base your answer to the following question on the passage below and on your knowledge of Earth Science.

Cosmic Microwave Background Radiation

In the 1920s, Edwin Hubble's discovery of a pattern in the red shift of light from galaxies moving away from Earth led to the theory of an expanding universe. This expansion implies that the universe was smaller, denser, and hotter in the past. In the 1940s, scientists predicted that heat (identified as cosmic microwave background radiation) left over from the Big Bang would fill the universe. In the 1960s, satellite probes found that cosmic microwave background radiation fills the universe uniformly in every direction, and indicated a temperature of about 3 kelvins (K). This radiation has been cooling as the universe has been expanding.

Which graph best shows the relationship of the size of the universe to the temperature indicated by the cosmic microwave background radiation?

1)

2)

3)

4)
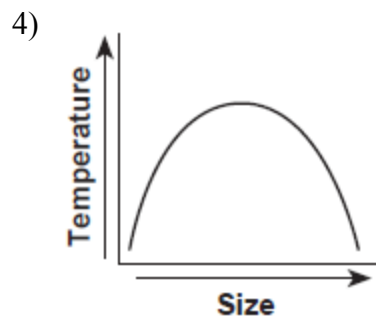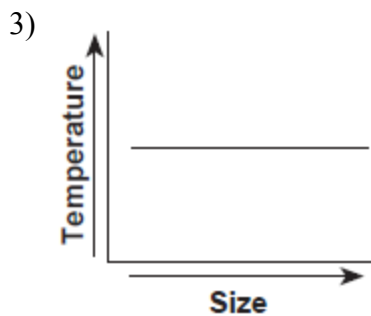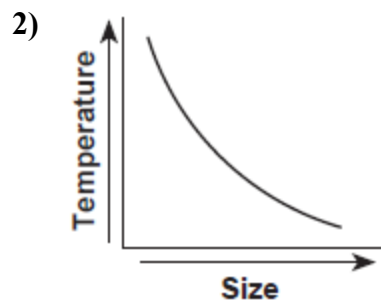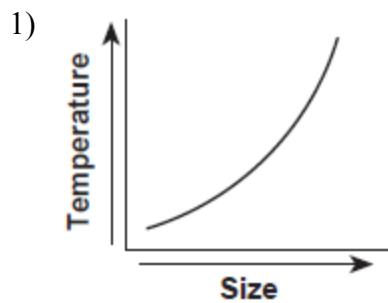
47. Base your answer to the following question on the diagram below and on your knowledge of Earth science. The diagram represents two possible sequences in the evolution of stars.

Stages of Star Evolution
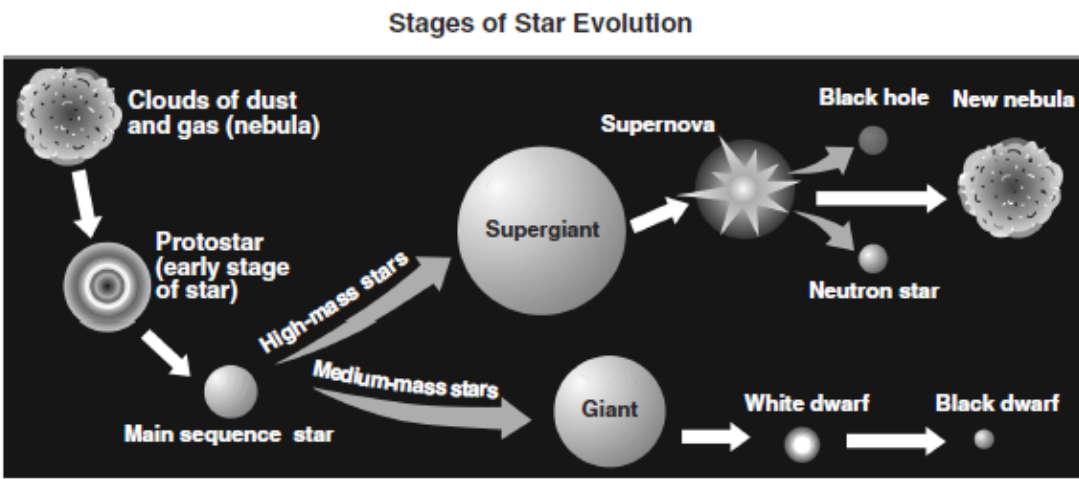
(Not drawn to scale)

Which table includes data that are characteristic of the surface temperature and luminosity of some white dwarf stars?

1)

Surface Temperature	5000 K
Luminosity	100

2)

Surface Temperature	5000 K
Luminosity	0.001

3)

Surface Temperature	10,000 K
Luminosity	100

4)

Surface Temperature	10,000 K
Luminosity	0.001

Base your answers to questions **48** and **49** on your knowledge of Earth science. The map shows an area of New York State that includes a campsite, trail, and buildings near a lake. Points *A, B, C,* and *D* represent locations on the map.
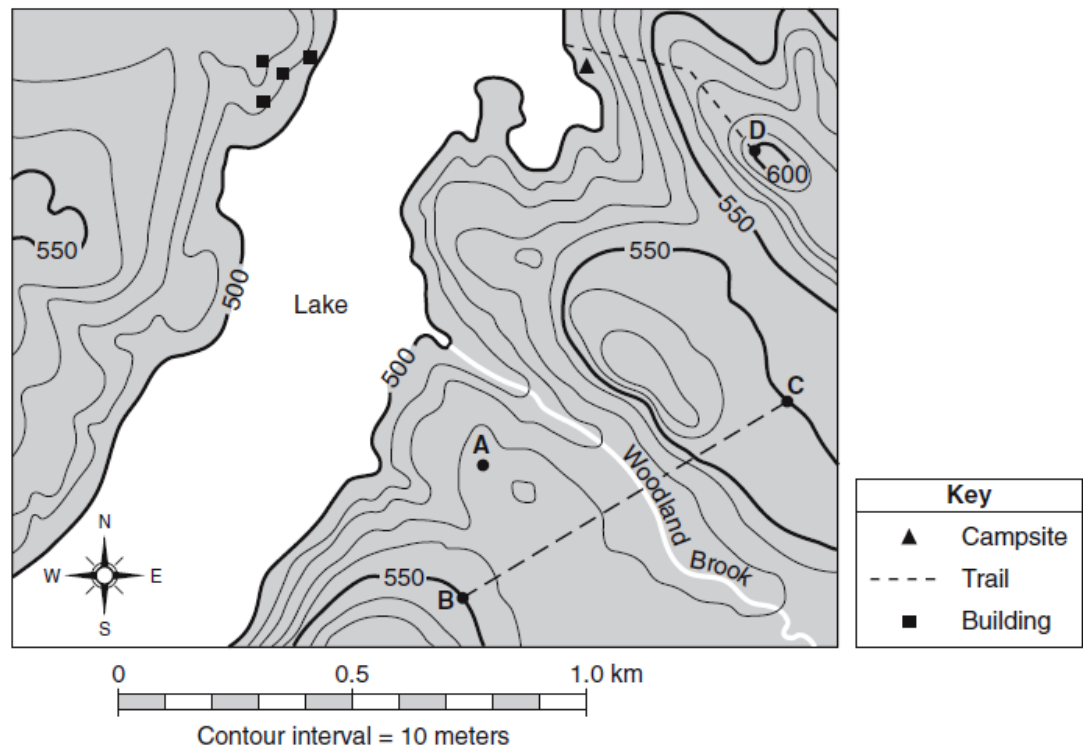
48. Circle the phrase that indicates the direction of flow of Woodland Brook. Describe the contour-line evidence that supports your answer.

    INTO THE LAKE ---------- OR ----------- OUT OF THE LAKE

    CONTOUR-LINE EVIDENCE:

49. Campers hiked **along the dotted line trail** from the shoreline of the lake to point *D* to view the landscape. Determine the average gradient, in meters per kilometer, of the route **along the trail** they took on their hike.

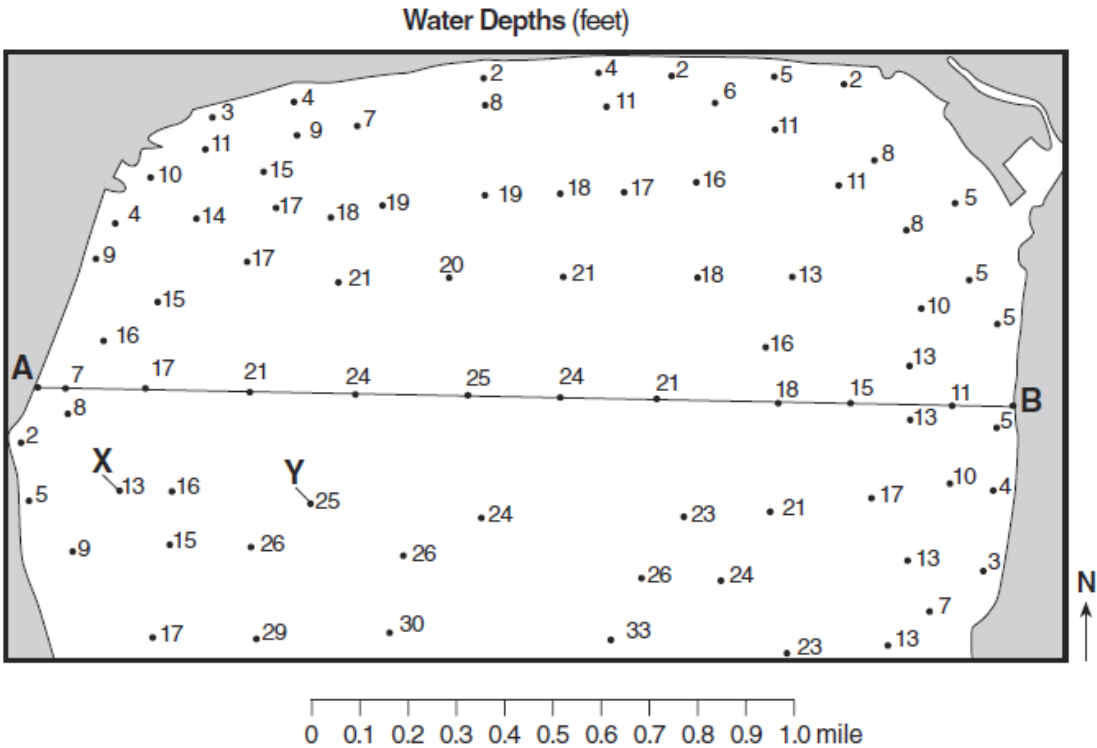   EQUATION

    PLUG IN DATA

    SOLVE WITH CORRECT UNITS

Base your answers to questions **50** and **51** on the map below and on your knowledge of Earth science. The map shows the four time zones and some latitude and longitude lines across the continental United States. Some cities are labeled on the map.
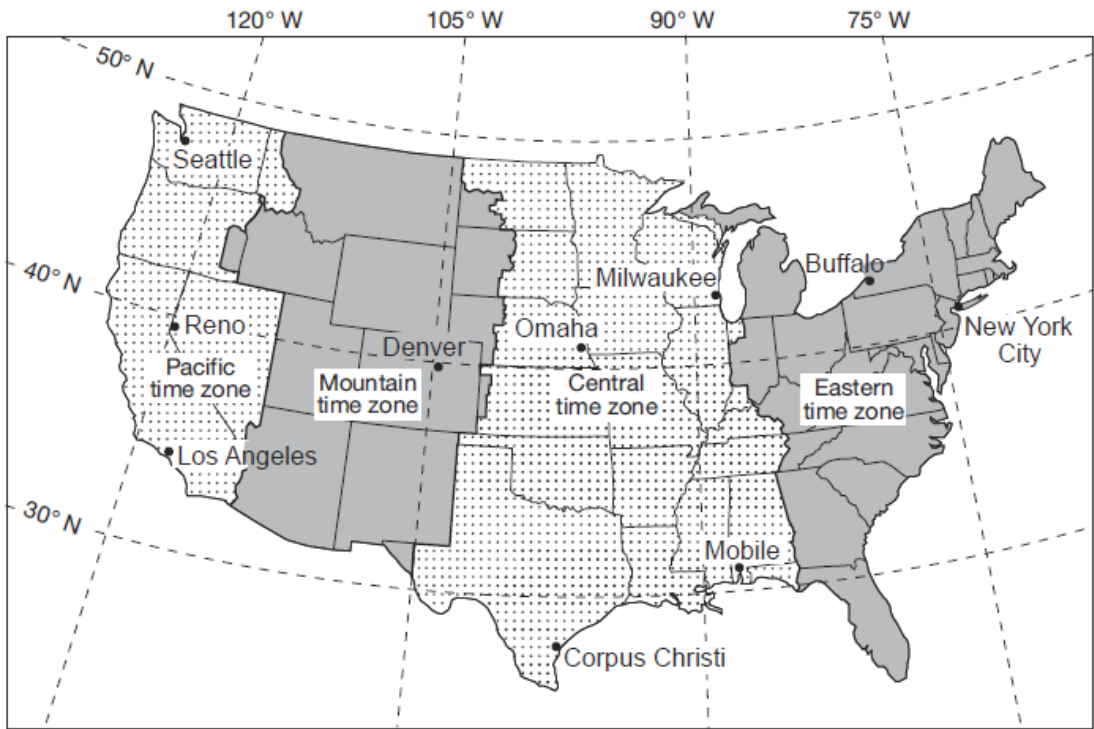

50. State the number of degrees of longitude that separates New York City from Milwaukee, Wisconsin, and the time difference, in hours, between these two cities.

51. Identify the city labeled on the map where sunrise occurs LAST each day.

Base your answers to questions **52** through **54** on the map in below. The map shows the water depth, measured in feet, at the north end of the Finger Lakes. Points *A* and *B* are locations at the lake's shoreline. Points *X* and *Y* are locations on the bottom of the lake.


Water Depths (feet)

52. Calculate the gradient between point *X* and point *Y*. Label your answer with the correct units.
    a. Write the equation

    b. Plug in Data

    c. Solve with correct units

53. On the grid below, construct a profile along the line from point *A* to point *B*. Plot the depth along line *AB* by marking an **X** at each numbered point where a water depth is shown. Complete the profile by connecting the **X**s with a smooth, curved line. The **X**s for point *A* and point *B* have been plotted.
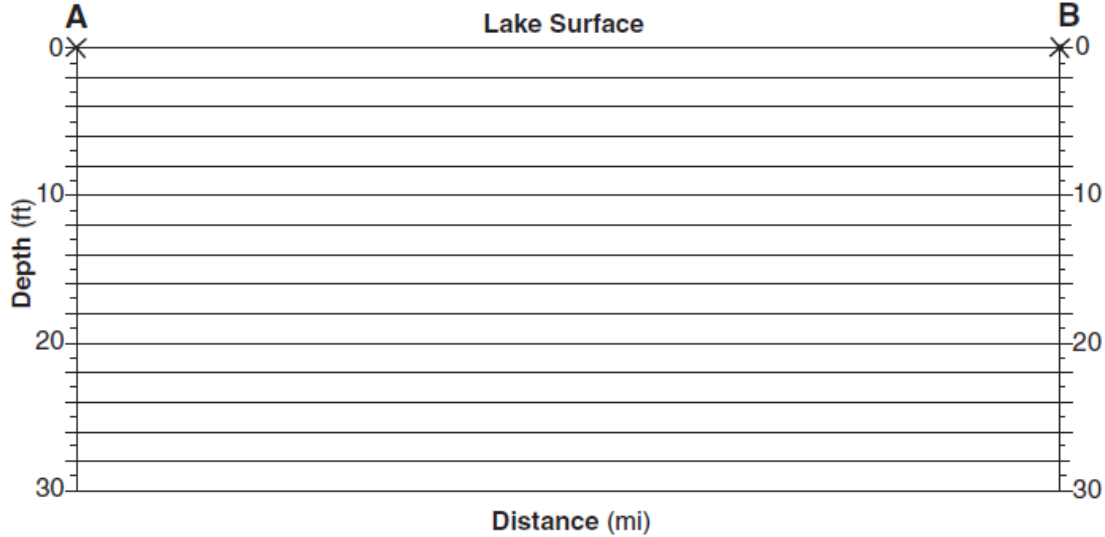
54. On the map above, draw the 20 foot-depth isoline. The isoline must extend to the edge of the map.

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55. Base your answer to the following question on the diagram below, which represents a model of the sky above a vertical post in New York State. The diagram shows the position of the Sun at solar noon on September 23 and the position of *Polaris* above the horizon.
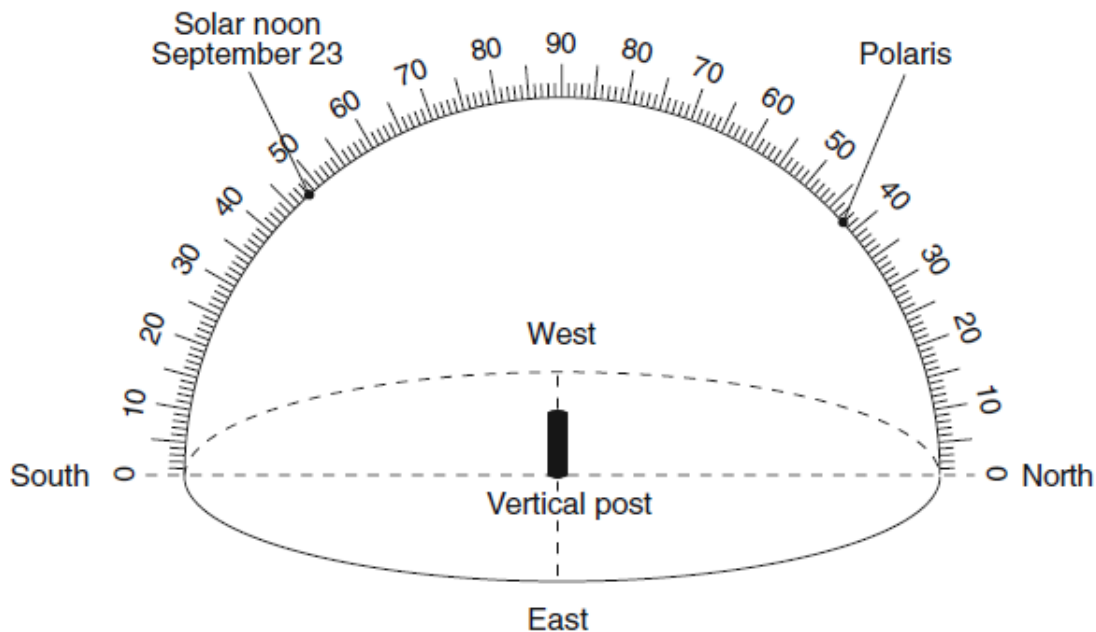
On the diagram above, draw the apparent path of the Sun across the sky on September 23 and place an X on the diagram above to indicate the altitude of the Sun at solar noon on June 21.

Answer Key
After School midterm review 2018

1. __1__
2. __2__
3. __2__
4. __2__
5. __1__
6. __1__
7. __2__
8. __4__
9. __3__
10. __4__
11. __2__
12. __4__
13. __2__
14. __3__
15. __3__
16. __4__
17. __2__
18. __2__
19. __2__
20. __2__
21. __2__
22. __2__
23. __4__
24. __2__
25. __1__
26. __1__
27. __1__
28. __4__
29. __4__
30. __3__
31. __3__
32. __3__
33. __3__
34. __4__
35. __1__
36. __3__

37. __1__
38. __4__
39. __3__
40. __2__
41. __2__
42. __1__
43. __3__
44. __2__
45. __2__
46. __2__
47. __4__
48. – The contour lines bend away from the lake where they cross the stream.
- The lones do not go straight across, but curve to the southeast when they cross Woodland Brook.
- The contour lines that cross Woodland Brook show the lowest elevation where the brook enters the lake.
- law of the Vs/Contour lines make a V shape that points uphill where they cross a stream.
- A river flows from a higher elevation to a lower elevation.
49. – 185 m/km - 215 m/km
50. — Longitude difference: any value from 45° to 47° — Time difference : 3 h
51. New York City *or* New York *or* NYC

52. – feet/mile (ft/mi)
53.
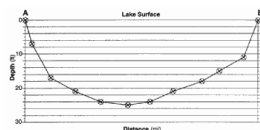
54.
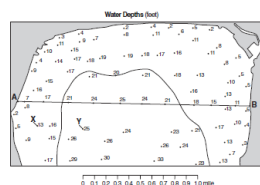
55. drawing the apparent path of the Sun from due east to due west and passing through the given solar noon position.