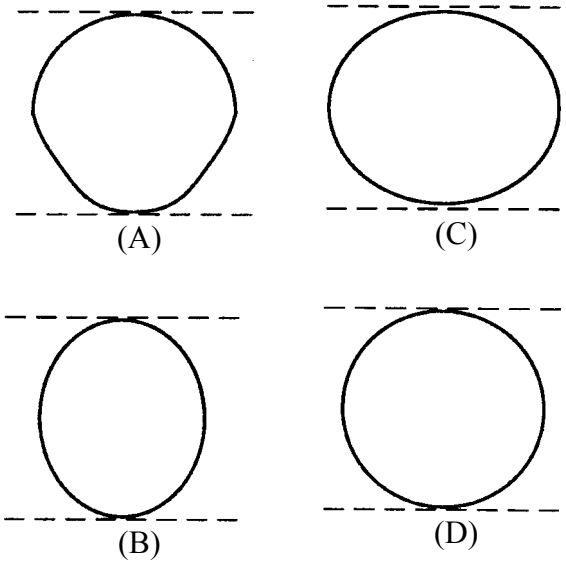
Earth's Dimensions Review Qs

1. Which of the following best explains why the Earth is slightly flattened from a perfect spherical shape?
   (A) Earth rotates on its axis
   (B) gravitational pull from the sun and moon
   (C) electromagnetic storms on the sun's surface
   (D) Earth's molten core

2. Which diagram most accurately shows the cross-sectional shape of the Earth?



3. The Earth's actual shape is most correctly described as
   (A) a circle
   (B) a perfect sphere
   (C) an oblate sphere
   (D) an eccentric ellipse

4. Which object best represents a true scale model of the shape of the Earth?
   (A) a Ping-Pong ball
   (B) a football
   (C) an egg
   (D) a pear

5. Precise measurements of the Earth indicate that its polar diameter is
   (A) shorter than its equatorial diameter
   (B) longer than its equatorial diameter
   (C) the same length as its equatorial diameter

6. If the base of a cloud is located at an altitude of 2 kilometers and the top of the cloud is located at an altitude of 8 kilometers, this cloud is located in the
   (A) troposphere, only
   (B) stratosphere, only
   (C) troposphere and stratosphere
   (D) stratosphere and mesosphere

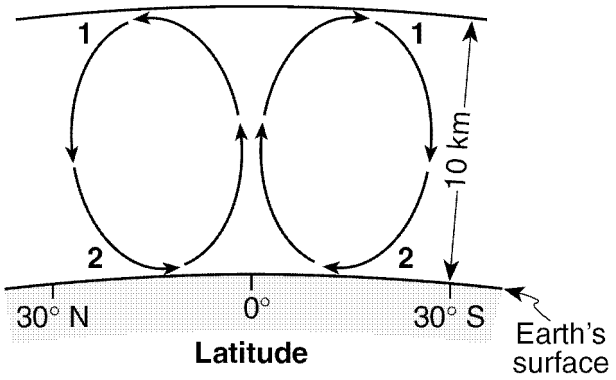
7. Earth’s early atmosphere formed during the Early Archean Era. Which gas was generally absent from the atmosphere at that time?
   (A) water vapor
   (B) carbon dioxide
   (C) nitrogen
   (D) oxygen

8. The two elements that make up the largest percentage by mass of Earth’s crust are oxygen and
   (A) silicon
   (B) potassium
   (C) hydrogen
   (D) nitrogen

9. The layer of bedrock near the Earth's surface that forms a continuous shell around the Earth is called the
   (A) troposphere
   (B) stratosphere
   (C) lithosphere
   (D) hydrosphere

10. Approximately what percent of the Earth's radius is represented by the crust?
    (A) less than 1%
    (B) 25%
    (C) 50%
    (D) 75%

Base your answers to questions **11** and **12** on the cross section below and on your knowledge of Earth science. The cross section shows the general movement of air within a portion of Earth's atmosphere located between 30° N and 30° S latitude. Numbers 1 and 2 represent different locations in the atmosphere.

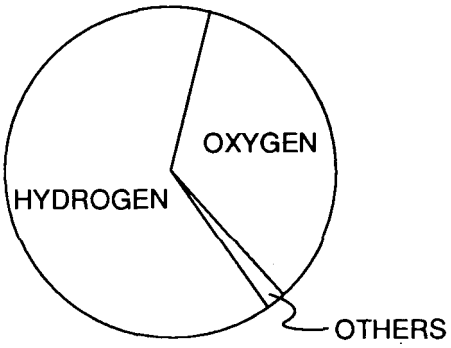


(Not drawn to scale)

11. What is the approximate percentage by volume of oxygen present in Earth's atmosphere at location 2?
(A) 10% (B) 21% (C) 33% (D) 46%

12. Which temperature zone layer of Earth's atmosphere is shown in the cross section?
(A) troposphere (B) stratosphere (C) mesosphere (D) thermosphere

13. The graph below represents percentage of elements by volume.



This graph best represents the elements of the Earth's
(A) lithosphere (C) troposphere
(B) hydrosphere (D) stratosphere

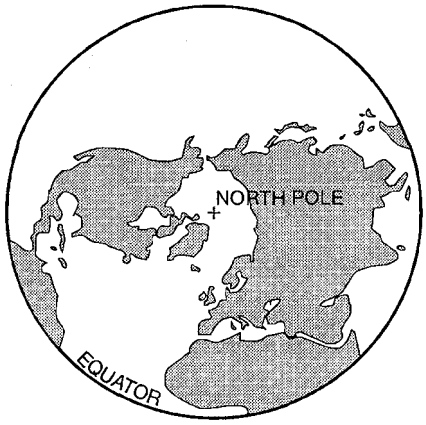
14. The solid rock material that directly underlies the sediments on the ocean floor is part of the Earth's
(A) lithosphere (C) troposphere
(B) hydrosphere (D) outer core

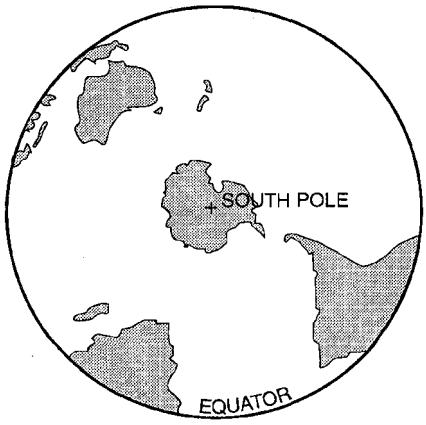
15. Earth's troposphere, hydrosphere, and lithosphere contain relatively large amounts of which element?
(A) iron (C) hydrogen
(B) oxygen (D) potassium

16. From which New York State location would Polaris be observed to have an altitude closest to 43° above the northern horizon?
(A) Binghamton (C) Watertown
(B) Utica (D) New York City

17. At which New York State location will an observer most likely measure the altitude of *Polaris* as approximately 42°?
(A) Jamestown (C) Oswego
(B) Plattsburgh (D) New York City

18. The maps below show the Earth as viewed from above the North Pole and from above the South Pole.





Which statement is best supported by these maps?

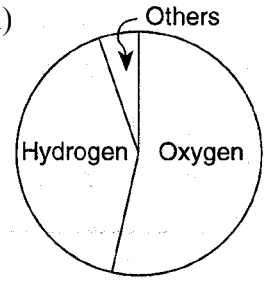
(A) Most of the Earth's surface is land.
(B) Most of the Earth's landmass is in the Northern Hemisphere.
(C) The geographic North Pole is the south magnetic pole.
(D) The geographic North Pole is the north magnetic pole.

19. What is the approximate location of the Canary Islands hot spot?

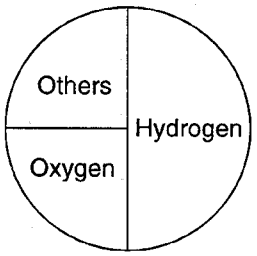
(A) 32° S 18° W
(B) 32° S 18° E
(C) 32° N 18° W
(D) 32° N 18° E

20. Which graph best represents the percentage by volume of the elements making up the Earth's hydrosphere?

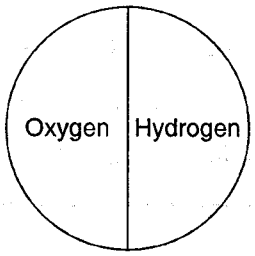
(A)



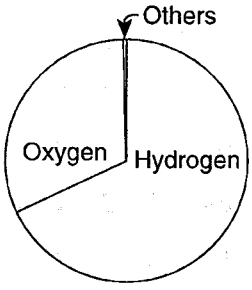
(B)



(C)



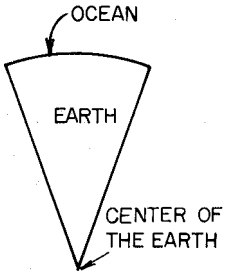
(D)



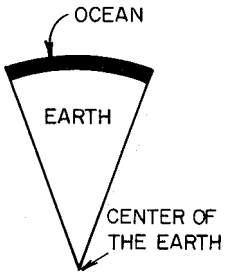
21. As a ship crosses the Prime Meridian, an observer on the ship measures the altitude *of Polaris* at 60°. What is the ship's location?

(A) 60° south latitude and 0° longitude
(B) 60° north latitude and 0° longitude
(C) 0° latitude and 60° east longitude
(D) 0° latitude and 60° west longitude

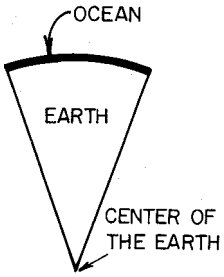
22. In the diagrams below, the dark zone at the surface of each wedge-shaped segment of the Earth represents average ocean depth. Which segment is drawn most nearly to scale?



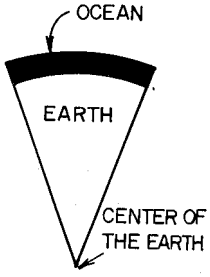
(A)



(C)

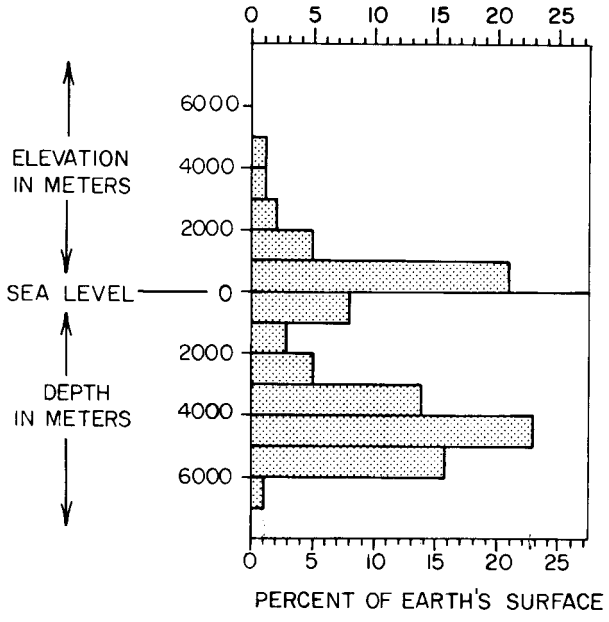


(B)



(D)

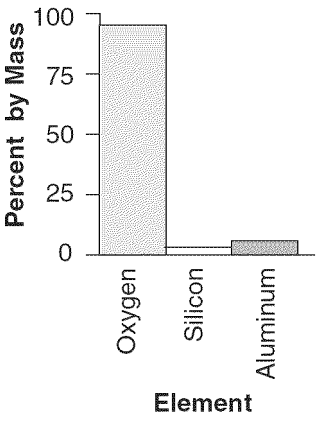
23. The graph below shows the percentage distribution of the Earth's surface elevation above and depth below sea level.



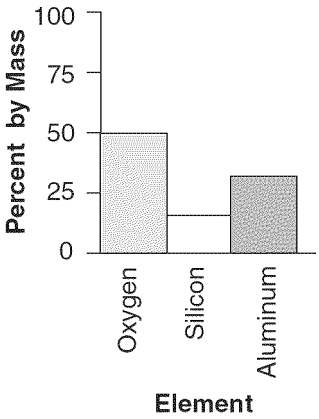
Approximately what total percentage of the Earth's surface is below sea level?

(A) 30%
(C) 70%
(B) 50%
(D) 90%

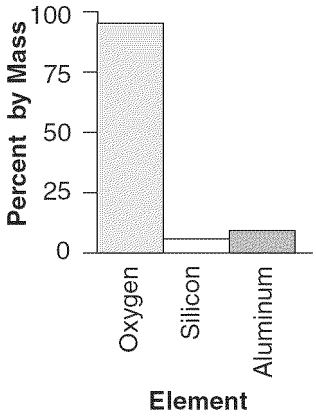
24. Which graph correctly represents the three most abundant elements, by mass, in Earth's crust?



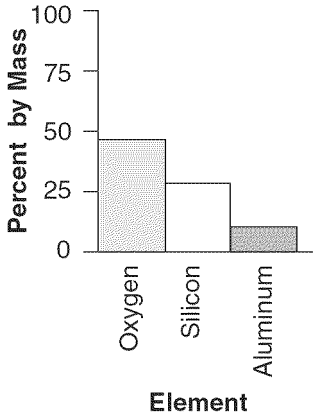
(A)



(B)

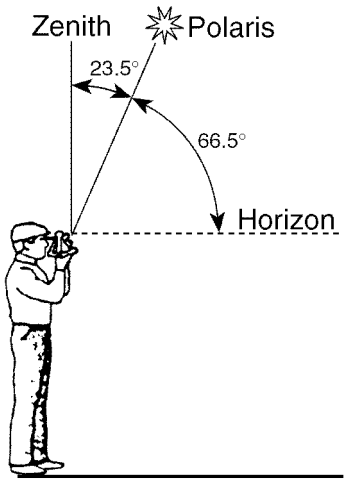


(C)



(D)

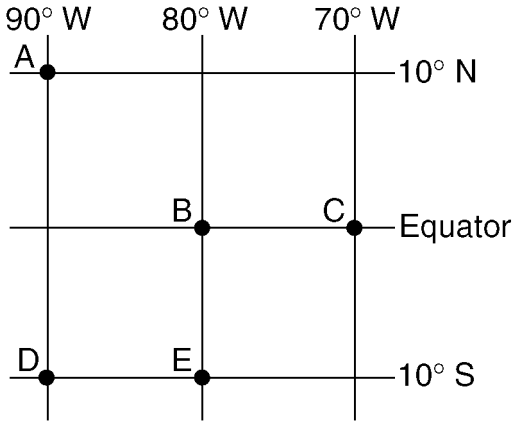
25. The diagram below shows an observer on Earth measuring the altitude of *Polaris*.



Which of the following can the observer determine from his measurement?

(A) longitude
(B) latitude
(C) time
(D) elevation above sea level

Base your answers to questions **26** and **27** on the map below, which shows the latitude and longitude of five observers, *A, B, C, D,* and *E,* on Earth.



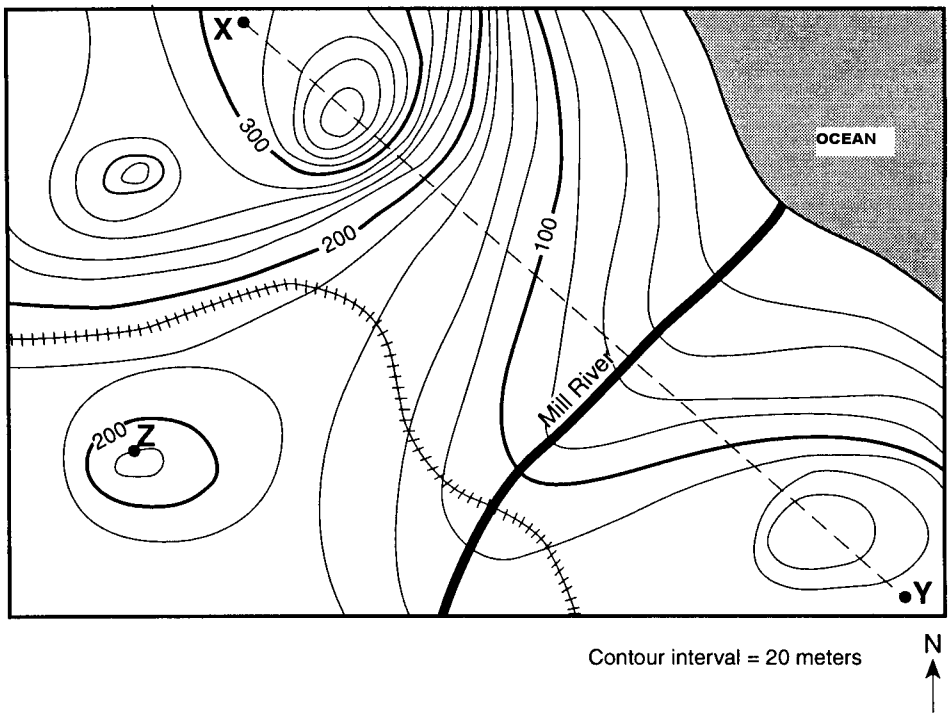
26. What is the altitude of *Polaris* (the North Star) above the northern horizon for observer *A*?

(A) 0° (C) 80°
(B) 10° (D) 90°

27. Which two observers would be experiencing the same apparent solar time?

(A) *A* and *C* (C) *B* and *E*
(B) *B* and *C* (D) *D* and *E*

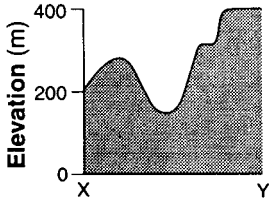
Base your answers to questions **28** through **30** on the topographic map below. Points *X*, *Y*, and *Z* are locations on the map. Elevations are expressed in meters.



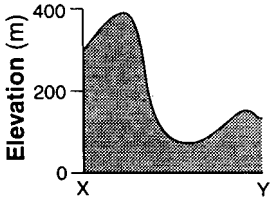
28. What is the elevation of point *Z*?
    (A) 190 m (B) 220 m (C) 240 m (D) 250 m

29. Mill River generally flows toward the
    (A) southeast (B) southwest (C) northeast (D) northwest

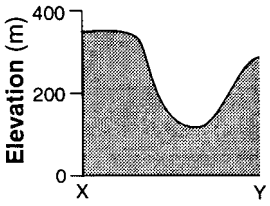
30. Which profile best represents the topography along the dashed line from point *X* to point *Y*?



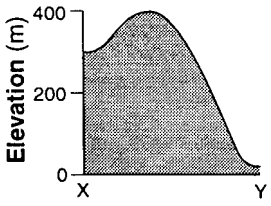
(A)



(B)

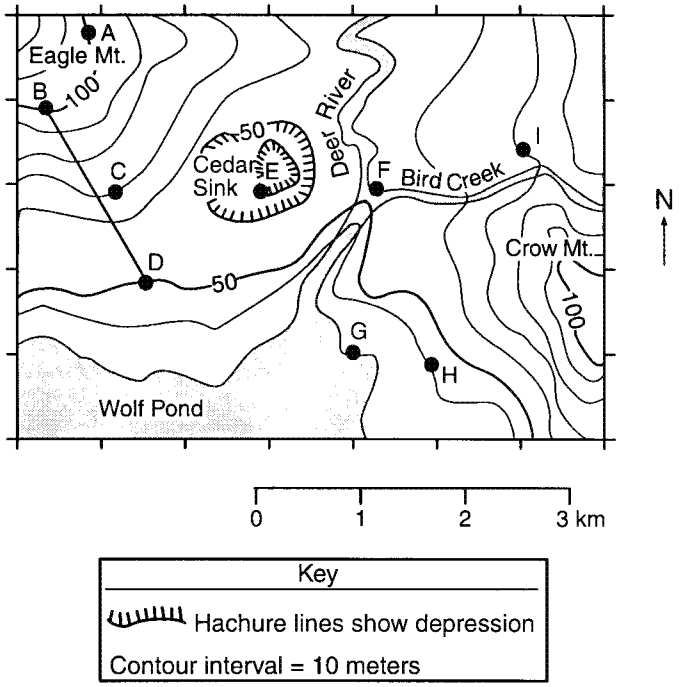


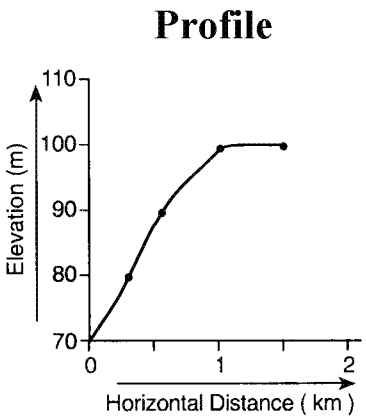
(C)



(D)

31. Base your answer to the following question on the topographic map below. Points *A* through *I* are locations on the map. Elevations are shown in meters.





Key

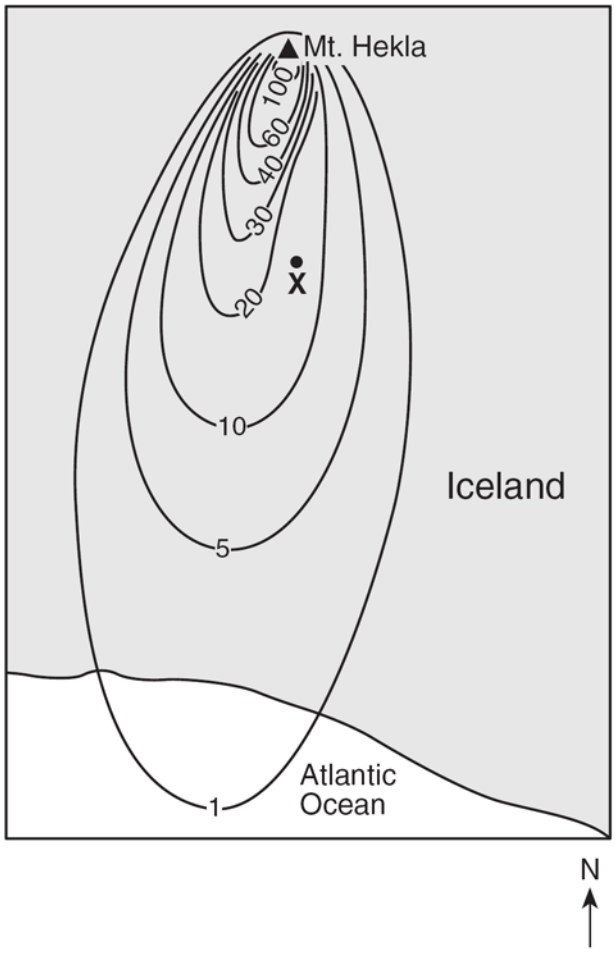
Hachure lines show depression

Contour interval = 10 meters

Which locations have the same elevation?

(A) *A* and *C* (B) *B* and *E* (C) *C* and *I* (D) *F* and *G*

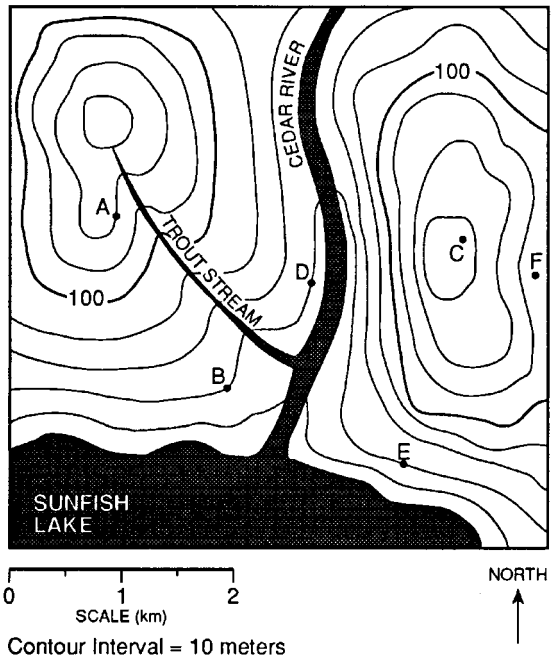
Base your answers to questions **32** and **33** on the map below. The black triangle represents Mt. Hekla, a volcano in Iceland. The isolines represent the thickness of ash, in centimeters, that settled on Earth's surface after the volcanic eruption of Mt. Hekla on March 29, 1947. Point *X* is a location on the surface of the ash.



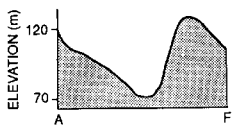
32. What was the thickness of the ash at point *X*?
(A) 5 cm. (C) 20 cm.
(B) 15 cm. (D) 30 cm.

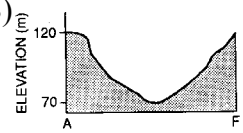
33. At the time of the eruption, the wind direction was primarily from the
(A) east (C) north
(B) west (D) south

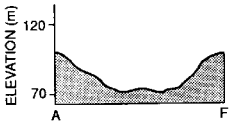
Base your answers to questions **34** and **35** on the contour map below. Points *A* through *F* represent locations on the map.

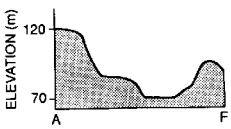


34. Which diagram best represents the topographic profile from location *A* to location *F*?

(A)


(B)


(C)


(D)


35. Toward which compass direction does Trout Stream flow?

(A) Northwest (C) Southwest
(B) Northeast (D) Southeast

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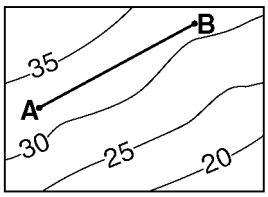
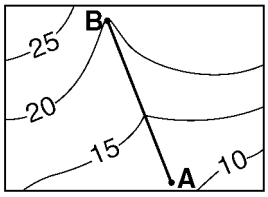
36. On each topographic map below, the straight-line distance from point *A* to point *B* is 5 kilometers. Which topographic map shows the steepest gradient between *A* and *B*?

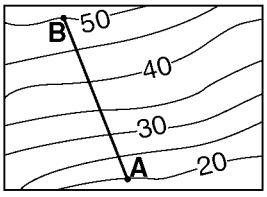
(A)



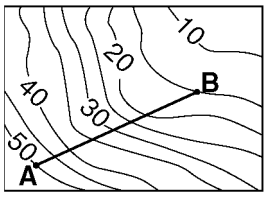
(B)



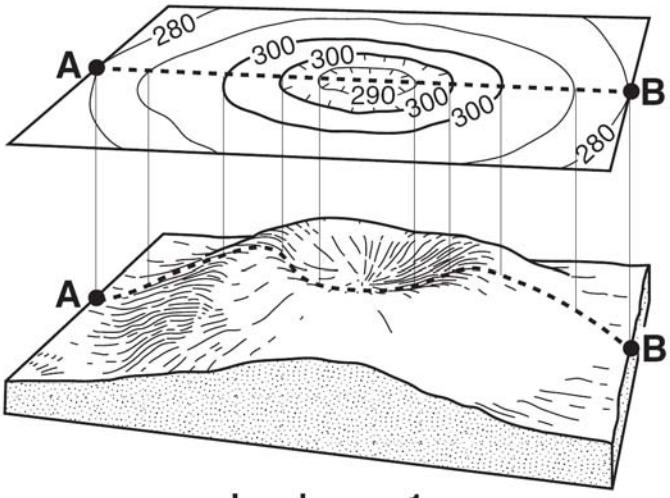
(C)



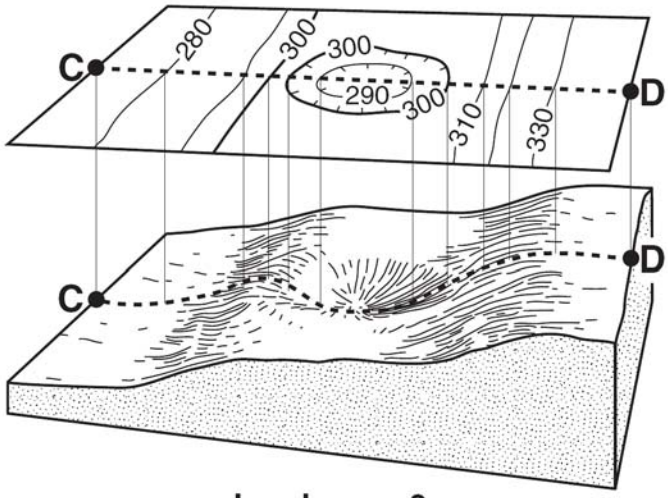
(D)



Base your answers to questions **37** and **38** on the topographic maps and block diagrams of two landscape regions shown below. The block diagrams show a three-dimensional view of the topographic maps directly above them. Elevations are measured in feet. Points *A*, *B*, *C*, and *D* are locations on Earth's surface.

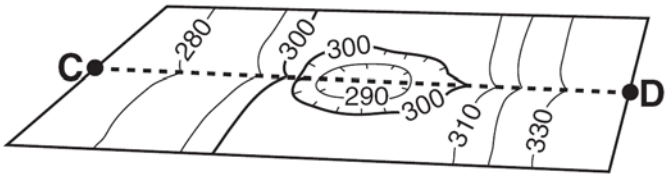


Landscape 1

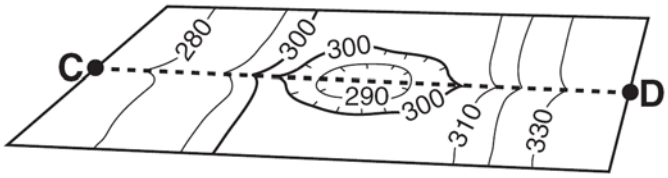


Landscape 2

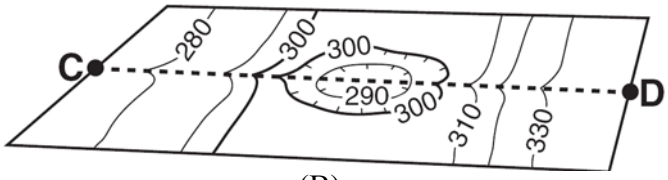
37. A stream begins to flow downhill from point *D* toward the depression. After a period of time, the depression fills with water. Overflowing water from the depression moves downhill toward point *C*. Which topographic map shows the most likely resulting change in the contour lines?



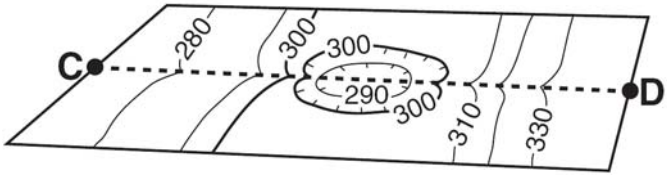
(A)



(C)



(B)

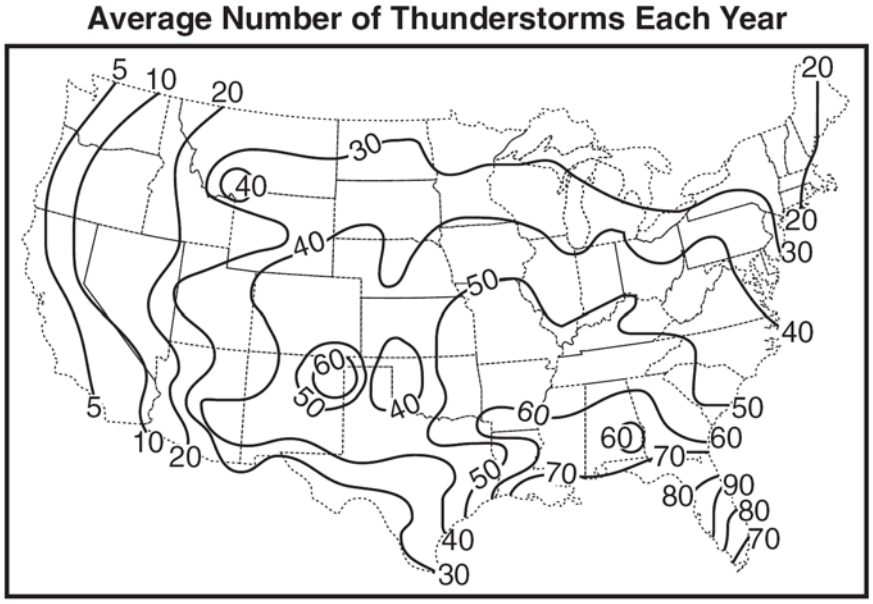


(D)

38. Which contour interval is used on both topographic maps?

(A) 10 ft (B) 20 ft (C) 30 ft (D) 40 ft

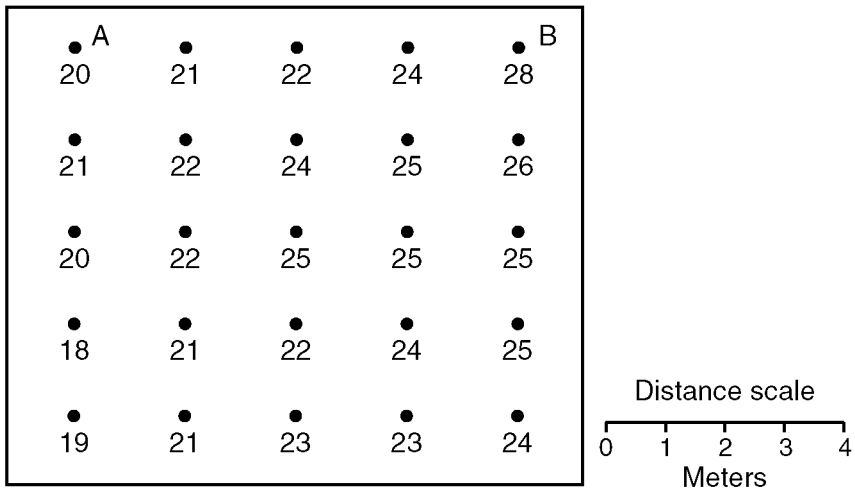
39. The map below shows the average number of thunderstorms during the year in the continental United States.



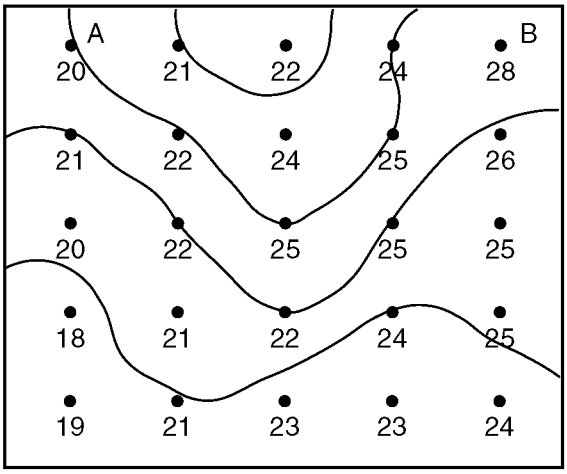
Which New York State landscape region normally experiences the most thunderstorms?

(A) Allegheny Plateau
(B) Taconic Mountains
(C) Adirondack Mountains
(D) Champlain Lowlands

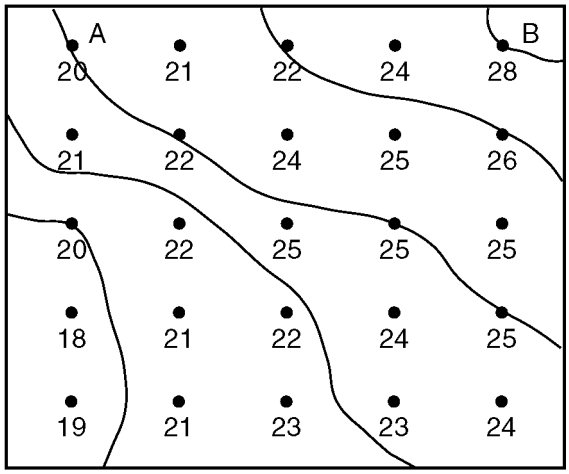
40. The field map below shows air temperature measurements, in degrees Celsius, taken at the same elevation within a closed room. Two reference points, *A* and *B*, are shown.



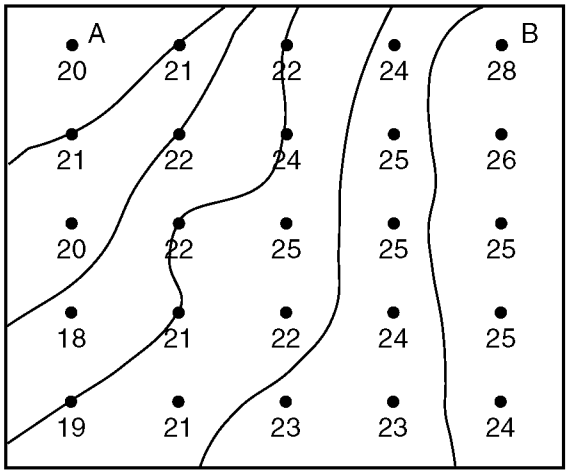
Which temperature field map shows correctly drawn isotherms?



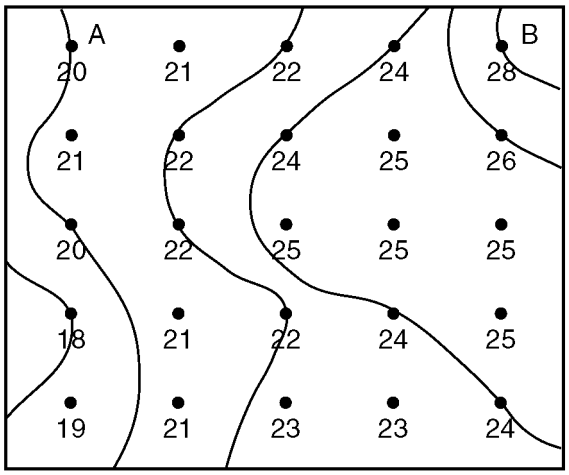
(A)



(C)

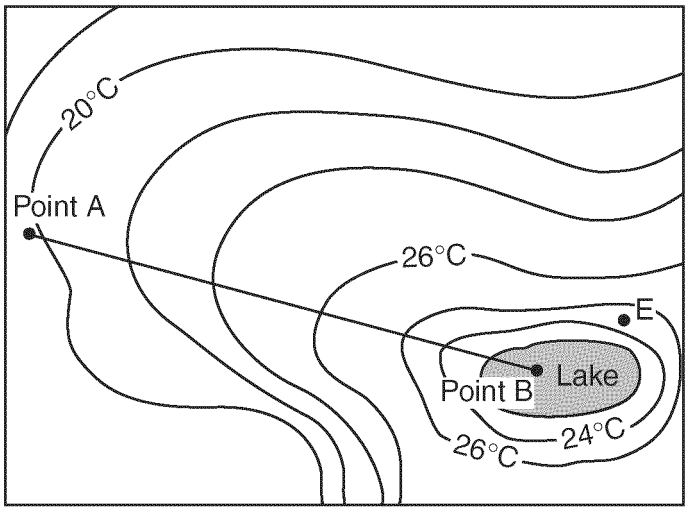


(B)

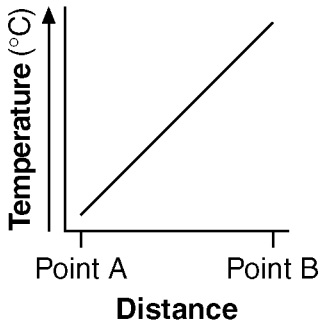


(D)

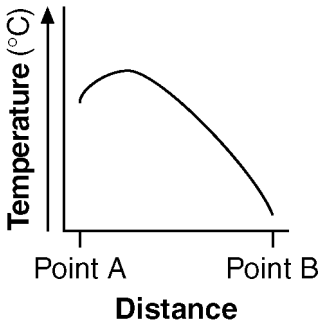
41. The temperature field map below represents surface air temperatures within a park. The location of a lake within the park is also indicated.



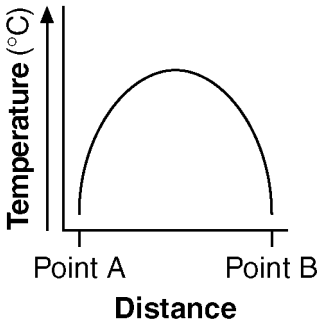
Which graph best represents the temperature profile along a straight line from point *A* to point *B*?



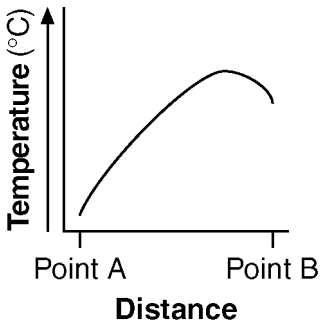
(A)



(C)

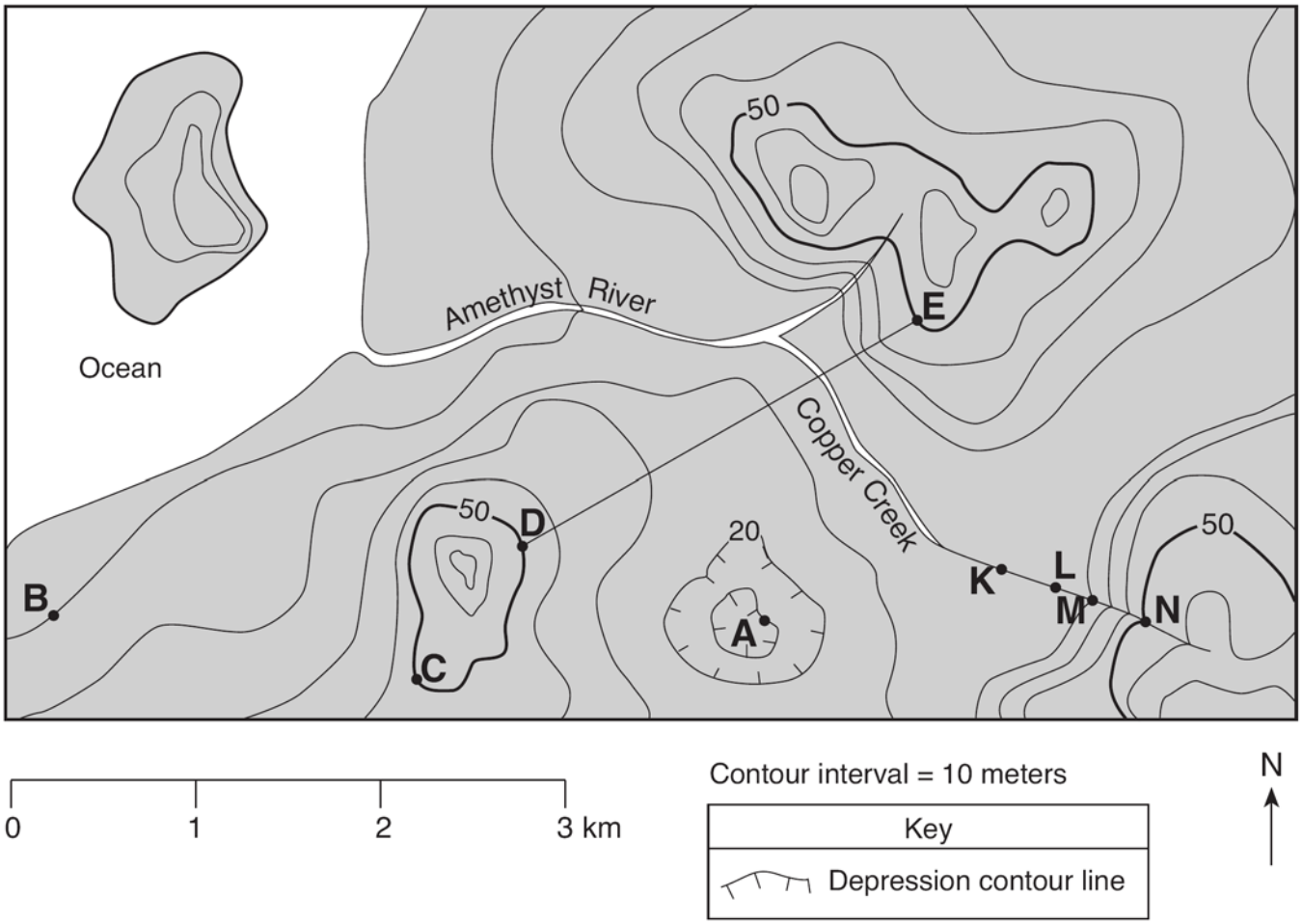


(B)



(D)

Base your answers to questions **42** through **45** on the topographic map shown below. Letters *A*, *B*, *C*, *D*, and *E* represent locations on Earth's surface. Letters *K*, *L*, *M*, and *N* are locations along Copper Creek. Elevations are measured in meters.



42. Explain how the map indicates that Copper Creek flows faster between points *N* and *M* than between points *L* and *K*.

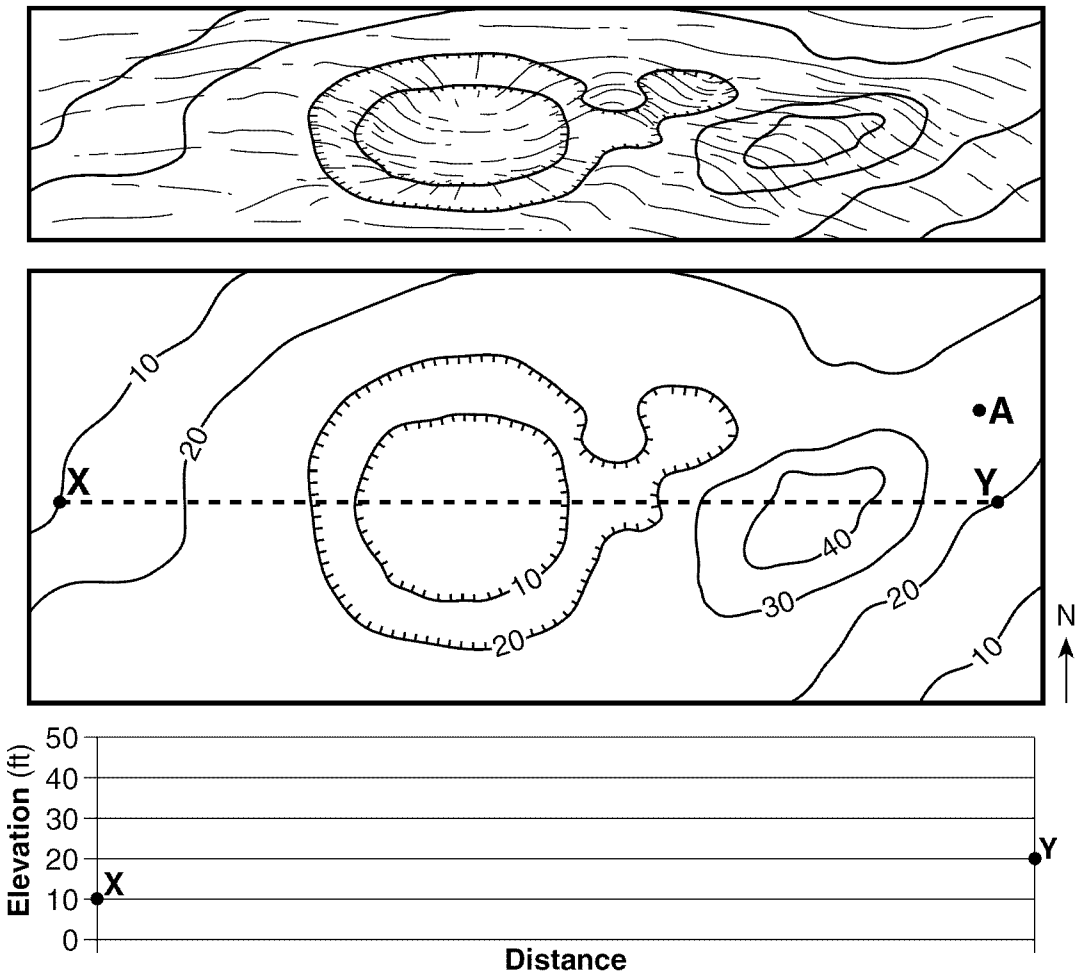
43. On the grid below, construct a topographic profile along line *DE* by plotting an **X** for the elevation of each contour line that crosses line *DE*. Connect the **X**s with a smooth, curved line to complete the profile.

44. Calculate the gradient between points *B* and *C* and label your answer with the correct units.

45. What is the elevation of location *A*?

_____

Base your answers to questions **46** and **47** on the diagrams below. The top diagram shows a depression ai hill on a gently sloping area. The bottom diagram is a topographic map of the same area. Points *A,* X, and *Y a* locations on Earth's surface. A dashed line connects points X and *Y.* Elevation is indicated in feet.

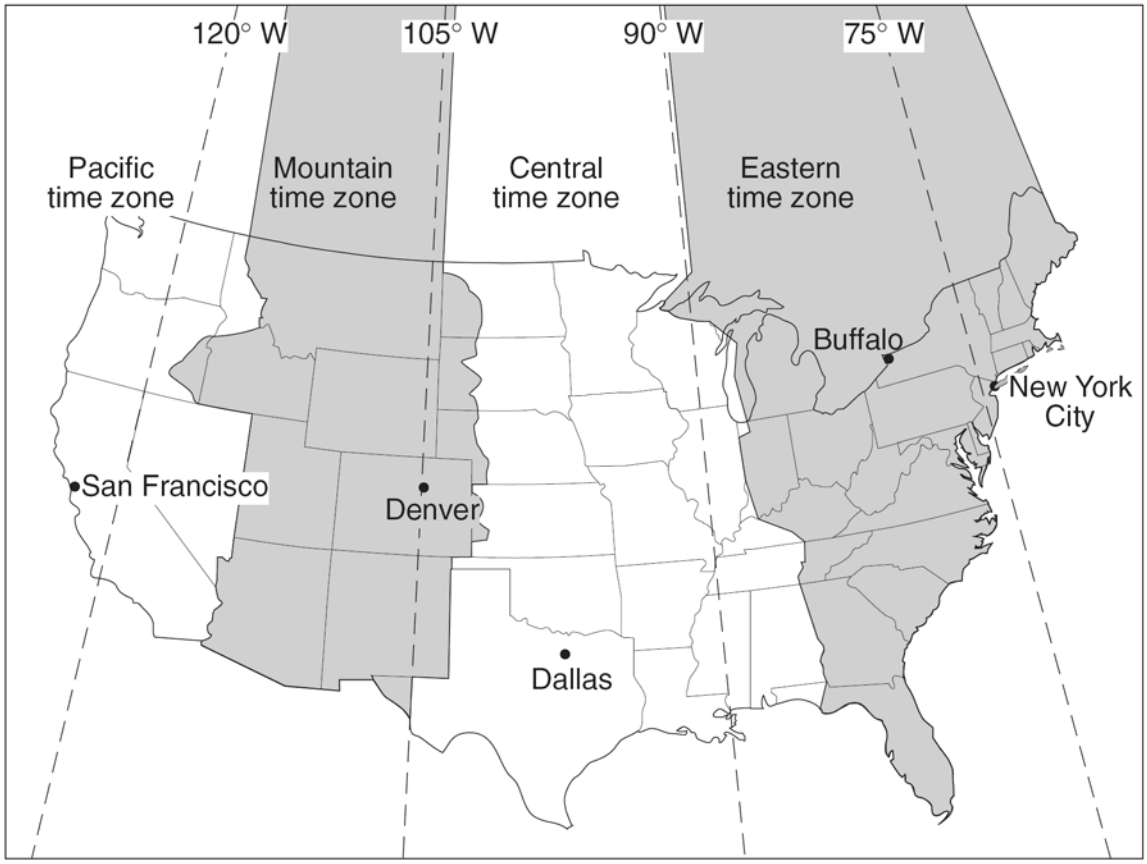


46. Construct a topographic profile along line *XY* on the grid by plotting a point for the elevation of *each* contour line that crosses line *XY.* Points *X* and *Y* have already been plotted on the grid. Connect the points with a smooth, curved line to complete the profile.

47. What is a possible elevation of point *A*?

_____

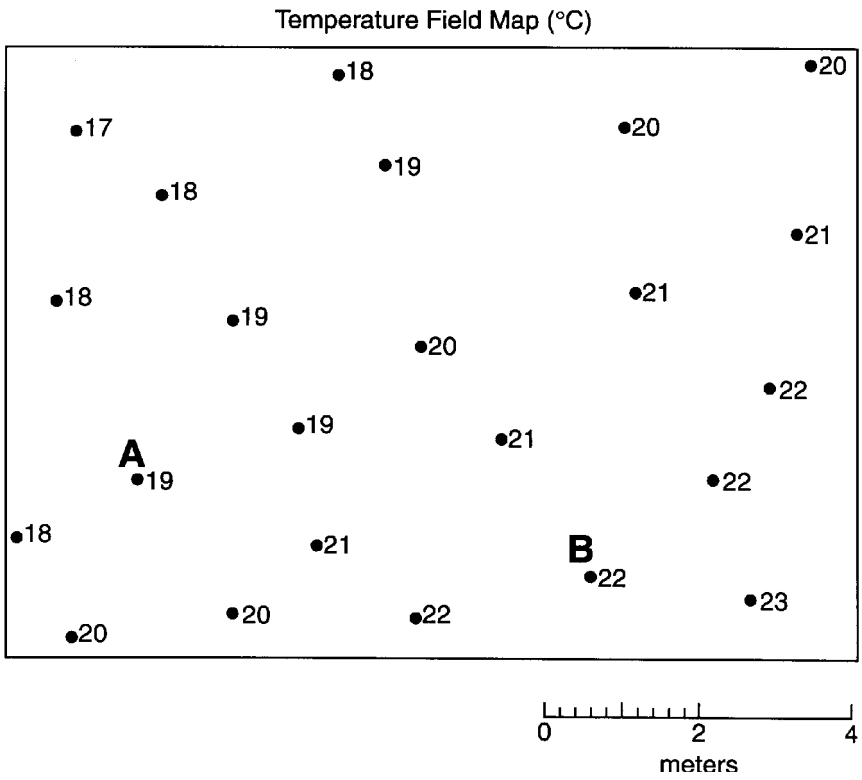
Base your answers to questions **48** and **49** on the United States time zone map shown below. The dashed lines represent meridians (lines of longitude).



48. The basis for the time difference between adjoining time zones is Earth's
    (A) 1° per hour rate of revolution
    (B) 1° per hour rate of rotation
    (C) 15° per hour rate of revolution
    (D) 15° per hour rate of rotation

49. If the time in Buffalo, New York, is 5 a.m., what time would it be in San Francisco, California?
    (A) 8 a.m. (B) 2 a.m. (C) 3 a.m. (D) 4 a.m.

Base your answers to questions **50** through **52** on the temperature field map below. The map shows temperature readings (ºC) recorded by students in a science classroom. The readings were taken at the same time at floor level. Temperature readings for points *A* and *B* are labeled on the map.



50. On the temperature field map, use solid lines to draw the 18ºC, 20ºC, and 22ºC isotherms. Isotherms must extend to the boundary of the map. Label each isotherm to indicate its temperature.

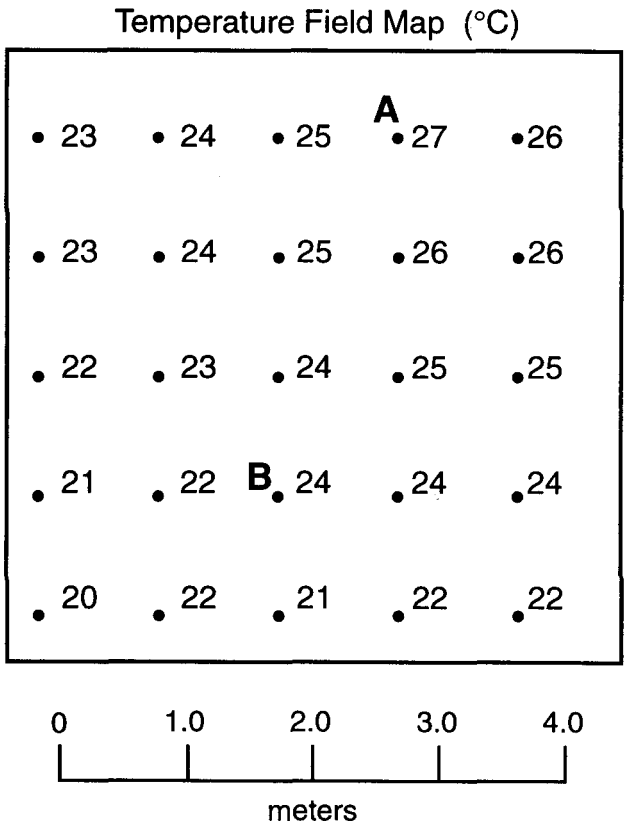
51. Determine the temperature gradient from point *A* to point *B* by following the directions below.

    a Write the equation used to determine the gradient.
    b Substitute values from the field map into the equation.
    c Solve the equation and label the answer with the proper units.

52. State the temperature of point *A* in degrees Fahrenheit (ºF).

_____

53. Base your answer to the following question on the temperature field map below. the map shows 25 measurements (in ºC) that were made in a temperature field and recorded as shown. The dots represent the exact location of the measurements. ***A*** and ***B*** are locations within the field.



Calculate the temperature gradient between locations A and B on the temperature field map, following the directions below.

a Write the equation for the gradient.
b Substitute data from the map into the equation.
c Calculate the gradient and label it with the

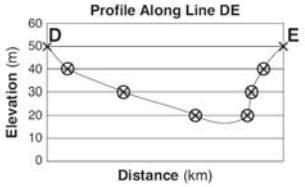
Earth's Dimensions Review Qs

Earth's Dimensions Review Qs
Answer Key

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

42. *Examples:* — Contour lines between *N* and *M* are closer together. — There is a steeper slope between *N* and *M*. — Where contour lines are far apart, there is a gentle slope and the stream velocity is less.

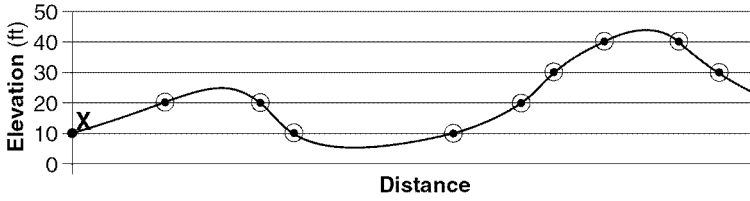
43.



44. Value from 18.9 to 21.1
Correct units:
— m/km
— meters/km
— m/kilometer

45. 10 m

46.

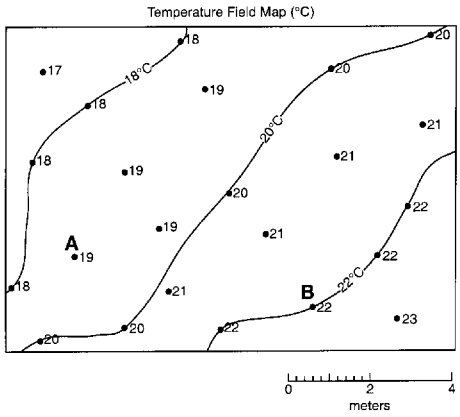


47. More than 20 ft but less than 30 ft.

48. D

49. B

50.



51. *a* gradient = change in field value/distance or g = $\Delta dT/d$; *b* gradient = $\frac{3^{o}C}{6\ m}$
c *0.5 ºC/m or* $\frac{1}{2}$*ºC/m*

52. approximately 66º

53. *a* gradient = change in field value / change in distance *or* Δ temperature / Δ distance
b gradient = 3°C / 3m
c 1°C/meter

54. D