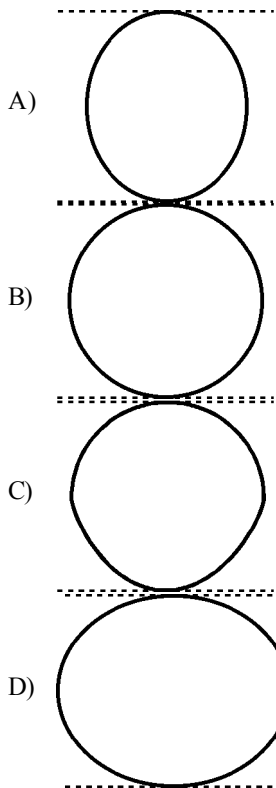


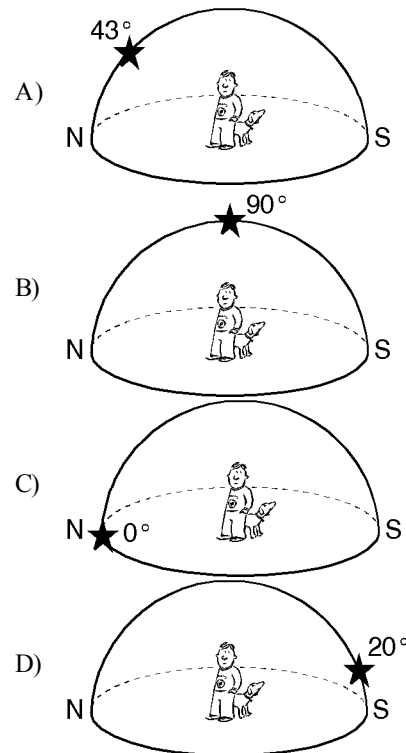
Name: _____

- 1) Earth's troposphere, hydrosphere, and lithosphere contain relatively large amounts of which element?
 A) potassium C) hydrogen
 B) oxygen D) iron
- 2) An air temperature of 95°C most often exists in which layer of the atmosphere?
 A) thermosphere C) troposphere
 B) mesosphere D) stratosphere
- 3) Which diagram most accurately shows the cross-sectional shape of the Earth?



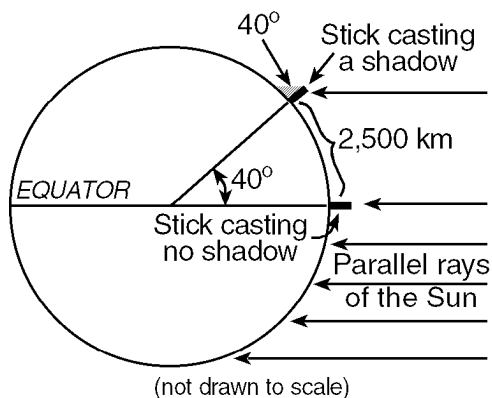
- 4) When the time of day for a certain ship at sea is 12 noon, the time of day at the Prime Meridian (0° longitude) is 5 p.m. What is the ship's longitude?
 A) 75° E C) 75° W
 B) 45° W D) 45° E
- 5) What are the two most abundant elements by mass found in Earth's crust?
 A) aluminum and iron
 B) oxygen and silicon
 C) sodium and chlorine
 D) calcium and carbon
- 6) Earth's hydrosphere is *best* described as the
 A) liquid outer layer of Earth
 B) solid outer layer of Earth
 C) gaseous layer extending several hundred kilometers from Earth into space
 D) magma layer located below Earth's stiffer mantle

- 7) Which diagram represents the approximate altitude of Polaris as seen by an observer located in Syracuse, New York?



- 8) The *best* evidence that the Earth has a spherical shape would be provided by
 A) the time the Earth takes to rotate on its axis at different times of the year
 B) photographs of the Earth taken from space
 C) the change in the time of sunrise and sunset at a single location during 1 year
 D) the prevailing wind direction at many locations on the Earth's surface

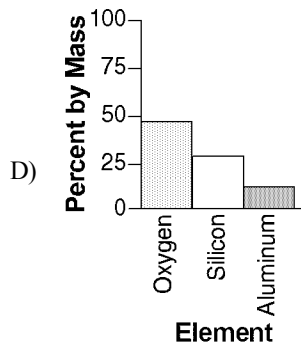
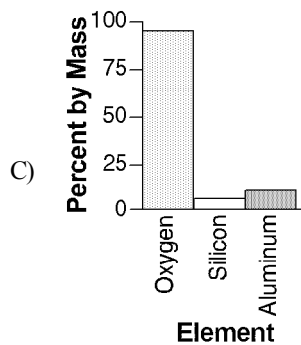
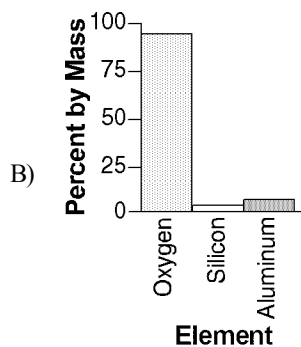
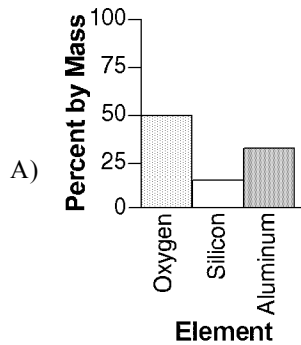
- 9) The diagram below illustrates Eratosthenes' method of finding the circumference of a planet. At noon, when a vertical stick at the Equator casts no shadow, a vertical stick 2,500 kilometers away casts a shadow and makes an angle of 40° with the rays of the Sun as shown.



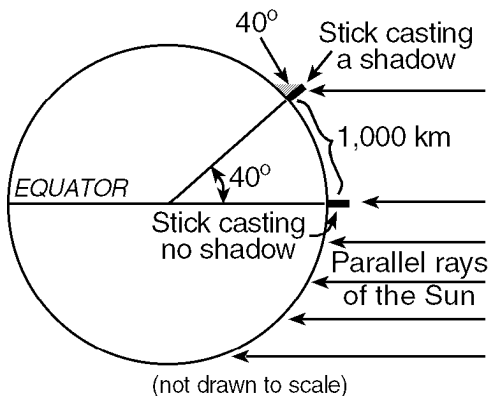
What is the circumference of this planet?

- A) 20,000 km C) 2,500 km
B) 45,000 km D) 22,500 km

- 10) Which graph correctly represents the three *most* abundant elements, by mass, in Earth's crust?

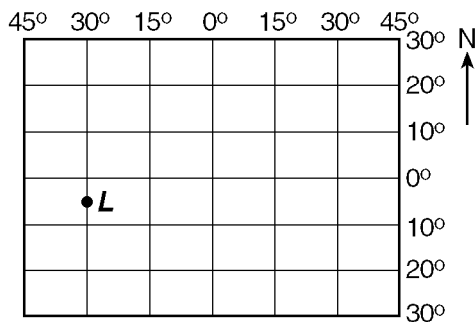


- 11) The diagram below illustrates Eratosthenes' method of finding the circumference of a planet. At noon, when a vertical stick at the Equator casts no shadow, a vertical stick 1,000 kilometers away casts a shadow and makes an angle of 40° with the rays of the Sun as shown.



What is the circumference of this planet?

- A) 40,000 km C) 9,000 km
 B) 12,000 km D) 4,000 km
- 12) The diagram below represents part of Earth's latitude-longitude system.



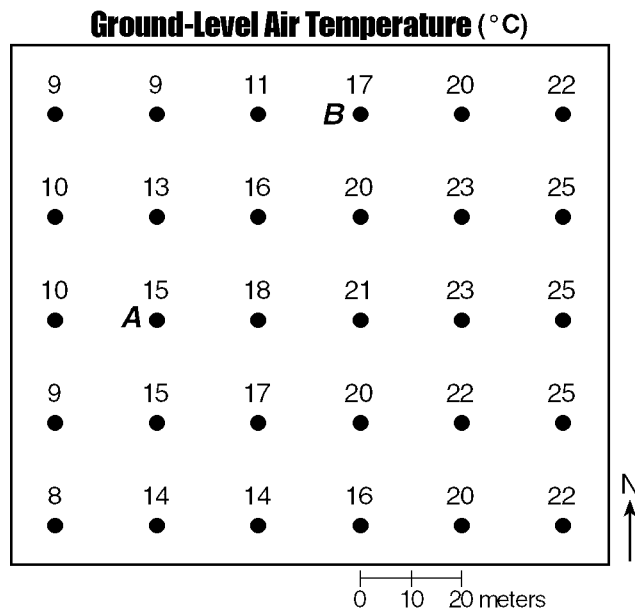
What is the latitude and longitude of point *L*?

- A) 5° N, 30° E C) 5° S, 30° W
 B) 5° W, 30° S D) 5° E, 30° N
- 13) At which location will the *highest* altitude of the star Polaris be observed?
- A) Equator
 B) Arctic Circle
 C) central United States
 D) Tropic of Cancer

- 14) How are latitude and longitude lines drawn on a globe of the Earth?
- A) Longitude lines are parallel and latitude lines meet at the Equator.
 B) Latitude lines are parallel and longitude lines meet at the Equator.
 C) Latitude lines are parallel and longitude lines meet at the poles.
 D) Longitude lines are parallel and latitude lines meet at the poles.
- 15) Ozone is concentrated in Earth's atmosphere at an altitude of 20 to 35 kilometers. Which atmospheric layer contains the *greatest* concentration of ozone?
- A) thermosphere C) troposphere
 B) mesosphere D) stratosphere

Questions 16 and 17 refer to the following:

The field map below shows air temperature at specific locations in an area near a school in New York State. Part of this area is a blacktop parking lot. Accurate temperature readings were taken by Earth Science students at 10 a.m. on June 1. Two reference points, *A* and *B*, are shown.



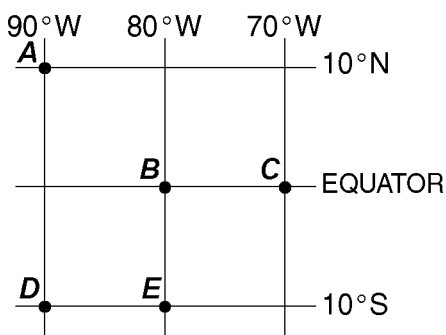
- 16) On the given field map, draw only the 15° C and the 20° C isotherms. [*Isotherms must be extended to the edge of the map.*]

- 17) Calculate the temperature gradient along a straight line between point *A* and point *B* on the given map by following the directions below.
- Write the equation for determining the temperature gradient.
 - Substitute the correct values into the equation.
 - Solve the equation and record your answer in decimal form. [*Label the answer with the correct units.*]

- 18) Which two observers would be experiencing the same apparent solar time?
- | | |
|--------------------------|--------------------------|
| A) <i>B</i> and <i>C</i> | C) <i>D</i> and <i>E</i> |
| B) <i>A</i> and <i>C</i> | D) <i>B</i> and <i>E</i> |
- 19) What is the altitude of Polaris (the North Star) above the northern horizon for observer *A*?
- | | |
|--------|--------|
| A) 0° | C) 80° |
| B) 90° | D) 10° |

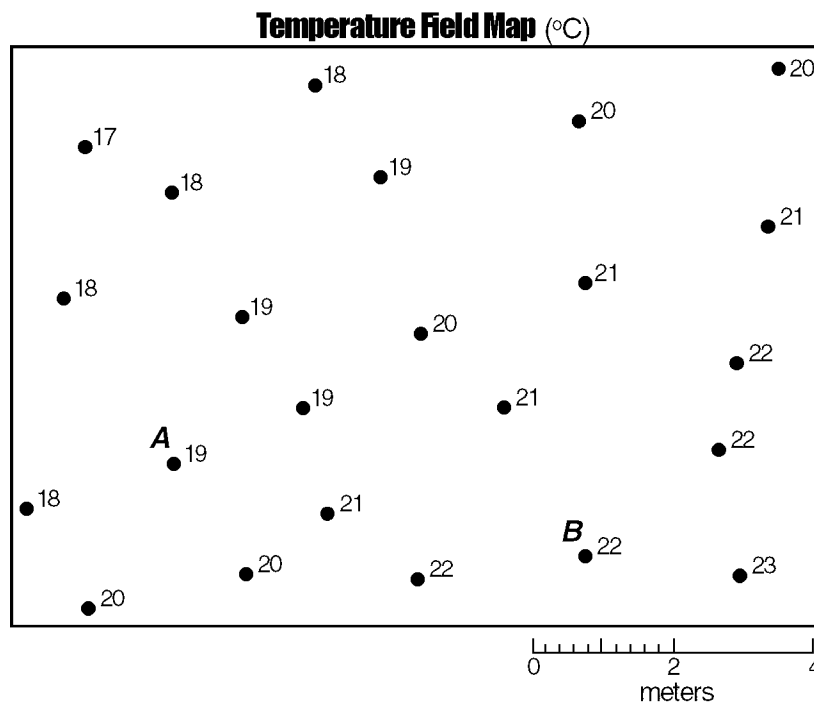
Questions 18 and 19 refer to the following:

The map below shows the latitude and longitude of five observers, *A*, *B*, *C*, *D*, and *E*, on Earth.



Questions 20 and 21 refer to the following:

The temperature field map below shows temperature readings (°C) 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.

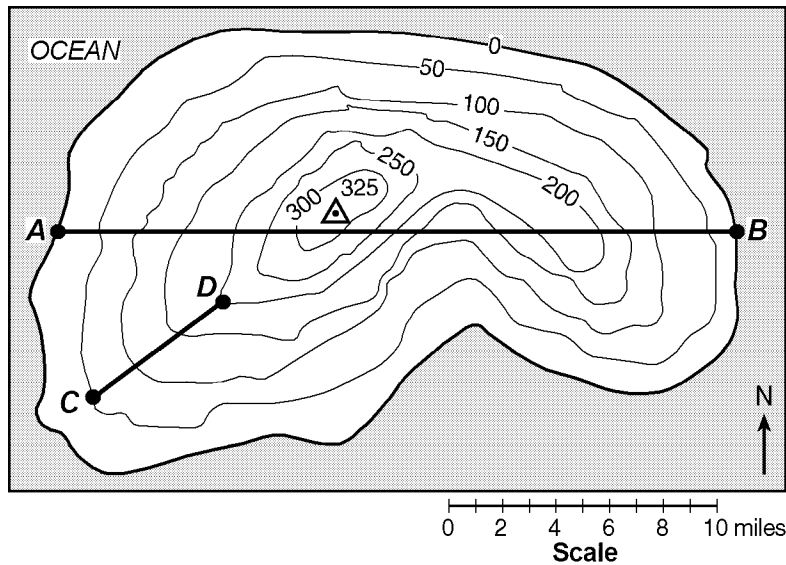


20) On the given temperature field map, use solid lines to draw the 18°C , 20°C , and 22°C isotherms. [Isotherms must extend to the boundary of the map. Label each isotherm to indicate its temperature.]

21) State the temperature (in degrees Fahrenheit [$^{\circ}\text{F}$]) of point A in the given map.

Questions 22 and 23 refer to the following:

On the topographic map of an island shown below, elevations are expressed in feet. Points A , B , C , and D are locations on the island. A triangulation point shows the highest elevation on the island.



22) On the grid below, construct a topographic profile representing the cross-sectional view between point A and point B , following the directions below.



- Plot the elevation of the land along line AB by marking, with a dot, the elevation of each point where a contour line is crossed by line AB .
- Connect the dots with a smooth, curved line to complete the topographic profile.

23) What is the average gradient, in feet per mile, along the straight line from point C to point D ?

24) The map below shows a portion of a drumlin field near Palmyra, New York. Elevations are in feet.

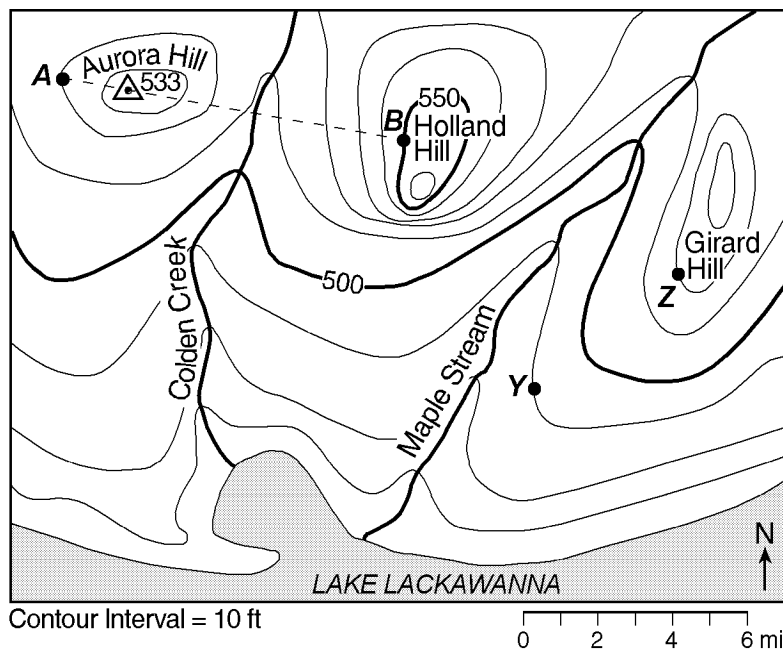


What is the contour interval of the given map?

- A) 25 ft B) 10 ft C) 20 ft D) 5 ft

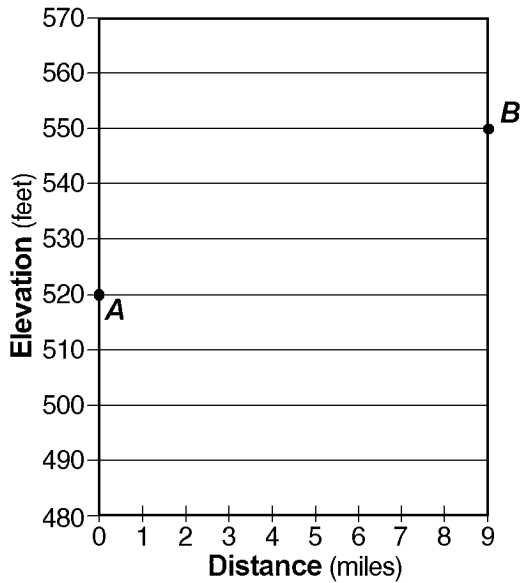
Questions 25 through 28 refer to the following:

On the topographic map below, points *A*, *B*, *Y*, and *Z* are reference points on the topographic map. The symbol $\triangle 533$ represents the highest elevation on Aurora Hill.



25) Describe the evidence shown on the map that indicates that the southern side of Holland Hill has the *steepest* slope.

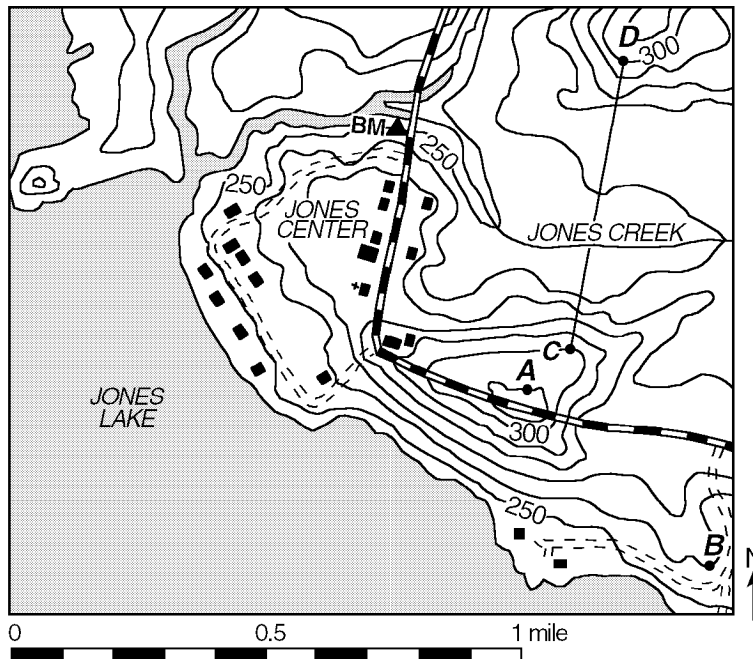
- 26) On the grid below, construct a topographic profile from point *A* to point *B* by following the directions below.
- Plot the elevation along line *AB* by marking with an **X** each point where a contour line is crossed by line *AB*. [*Points A and B have been plotted for you.*]
 - Complete the profile by correctly connecting the plotted points with a smooth, curved line.



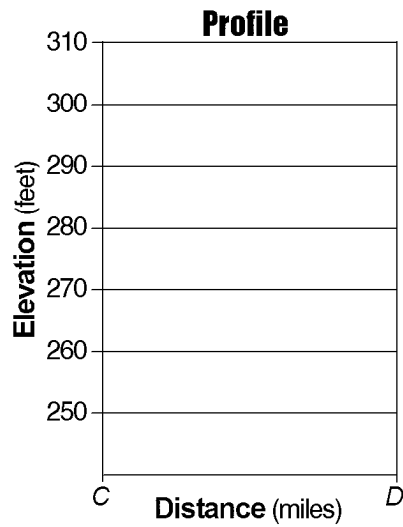
- 27) State the general compass direction in which Maple Stream is flowing.
- 28) Calculate the gradient between points *Y* and *Z* on the map. [*Label the answer with the correct units.*]

Questions 29 through 31 refer to the following:

Points *A* through *D* are locations on the topographic map below. Elevations are in feet.



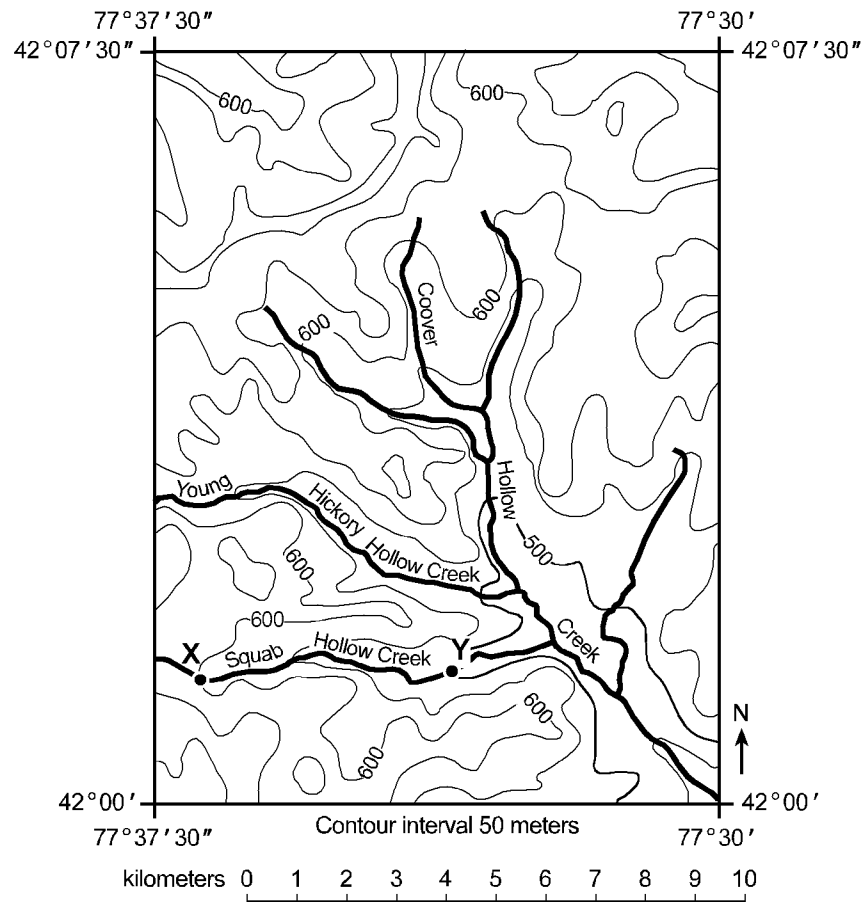
- 29) On the grid below, construct a profile of the land surface between point *C* and point *D* by following the directions below.
- Plot the elevations along line *CD* by marking with a dot each point where an isoline is crossed by line *CD*.
 - Connect the dots to complete the profile.



- 30) Determine the gradient from point *A* to point *B* by following the directions below.
- Write the equation for determining the gradient.
 - Substitute data from the map into the equation.
 - Calculate the gradient and label it with the proper units.
- 31) Explain briefly how the map can be used to determine that Jones Creek is flowing westward into Jones Lake.

Questions 32 and 33 refer to the following:

The topographic map below is of an area in New York State. Points *X* and *Y* are locations on Squab Hollow Creek.



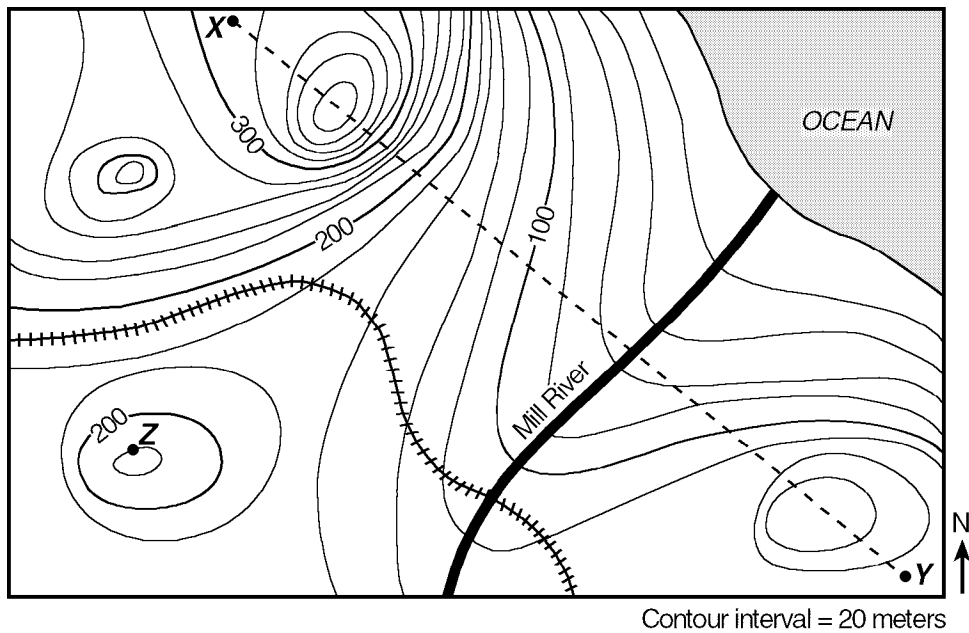
32) Describe *one* way to determine the direction of flow of Coover Hollow Creek from information shown on the map.

33) In the space below, determine the gradient of Squab Hollow Creek between point *X* and point *Y* by following the directions below.

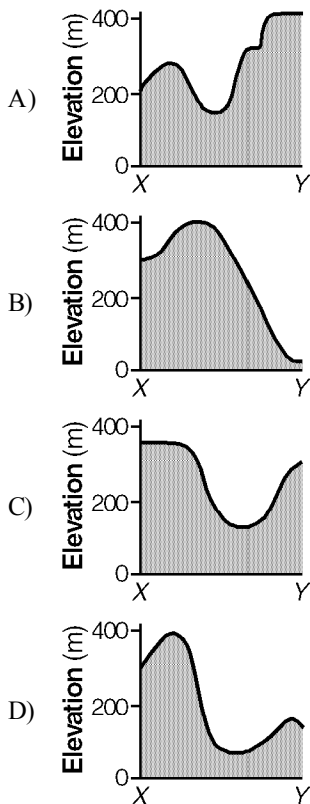
- Using the Earth Science Reference Tables, write the equation used to determine the gradient.
- Substitute values into the equation.
- Solve the equation and label the answer with the correct units.

Questions 34 through 36 refer to the following:

Points X, Y, and Z are locations on the topographic map below. Elevations are expressed in meters.

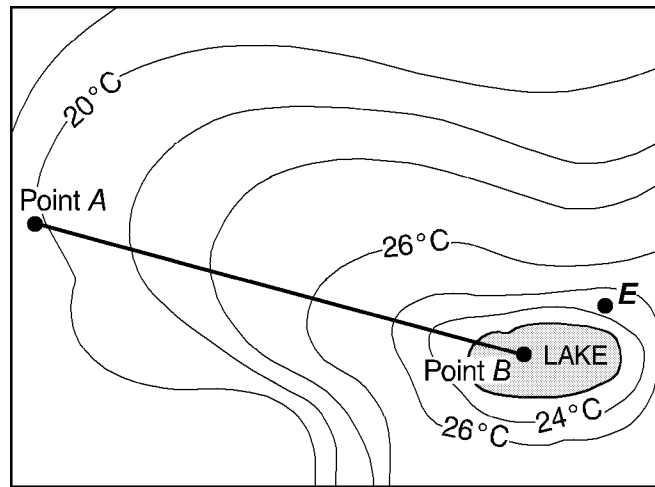


- 34) Mill River generally flows toward the
- A) southwest
 - B) southeast
 - C) northeast
 - D) northwest
- 35) Which profile *best* represents the topography along the dashed line from point X to point Y?

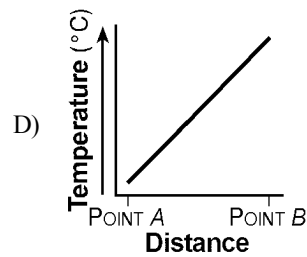
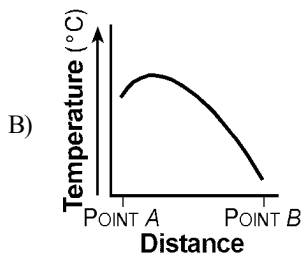
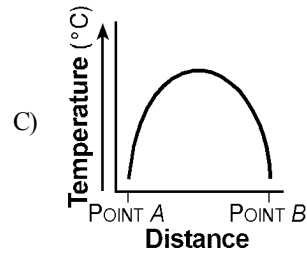
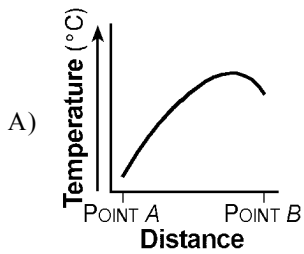


- 36) What is the elevation of point Z?
- A) 240 m
 - B) 220 m
 - C) 190 m
 - D) 250 m

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



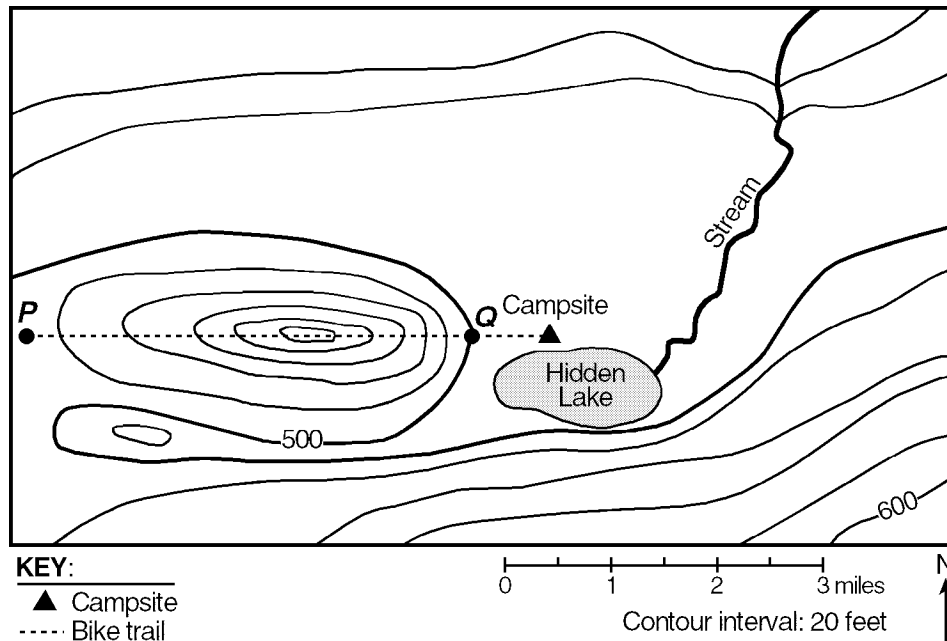
Which graph *best* represents the temperature profile along a straight line from point A to point B?



Questions 38 through 41 refer to the following:

A group of Earth Science students decided to take an adventurous camping trip, so they rode bicycles to a New York State park that was located in an isolated area. They traveled up a steep hill. When they reached the top, they looked at the landscape and noticed a lake at the bottom of the hill. They named it Hidden Lake. To the left of Hidden Lake was a large field with a small stream. They decided to set up their campsite in the field near Hidden Lake. To get to the field, they cycled down a very steep slope.

The map below shows the location of the bicycle trail and the students' campsite. Points *P* and *Q* are reference points on the map.



- 38) (a) The next day the students decided to move their campsite 1 mile directly east of their original campsite. On the given map, place another campsite symbol, ▲, to indicate the location of their second campsite.
- (b) The students decided to take a different route home to avoid riding their bicycles up the steep hill. Plan a return route that will take the campers back to point *P* and that will involve the least change in elevation during the trip. On the given map, draw a line from the second campsite to point *P* to show the route. Place arrows on the line to show the direction that the students will be traveling.
- 39) (a) State the general compass direction in which the stream is flowing in the given map.
- (b) State how contour lines provide the evidence for determining this direction.
- 40) On the grid below, draw a profile of the landscape along the bicycle trail from point *P* to point *Q* by following the directions below.
-
- (a) Plot the elevation along line *PQ* by marking with a dot each point where a contour line is crossed by line *PQ*. Point *P* and point *Q* have been plotted for you.
- (b) Connect the dots to complete the profile.
- 41) State the evidence shown on the given map that indicates that the area directly north of Hidden Lake is relatively flat.