

(Key)

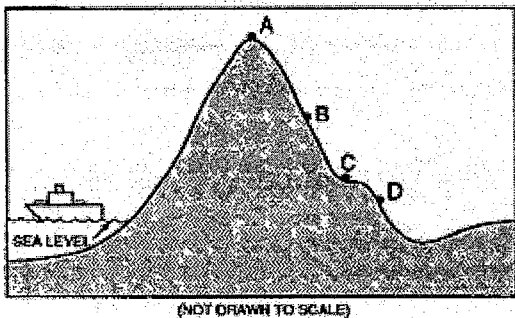
C 1 The Earth's actual shape is most correctly described as

- A) a circle
- B) a perfect sphere
- C) an oblate sphere
- D) an eccentric ellipse

A 2 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

D 3 In the diagram below, letters A through D represent the locations of four observers on the Earth's surface. Each observer has the same mass.



The gravitational force is strongest between the center of the Earth and the observer at location

- A) A
- B) B
- C) C
- D) D

B 4 The ozone layer protects life on Earth by absorbing harmful ultraviolet radiation. The ozone layer is located between 17 kilometers and 35 kilometers above Earth's surface in which atmospheric temperature zone?

- A) troposphere
- B) stratosphere
- C) mesosphere
- D) thermosphere

B 5 In which two Earth regions is oxygen the second most abundant element by volume?

- A) crust and hydrosphere
- B) hydrosphere and troposphere
- C) troposphere and core
- D) core and crust

A 6 What is the approximate percent of oxygen by volume present in Earth's lower atmosphere?

- A) 21%
- B) 33%
- C) 46%
- D) 94%

C 7 In which two temperature zones of the atmosphere does the temperature increase with increasing altitude?

- A) troposphere and stratosphere
- B) troposphere and mesosphere
- C) stratosphere and thermosphere
- D) mesosphere and thermosphere

D 8 An air temperature of 95°C most often exists in which layer of the atmosphere?

- A) troposphere
- B) stratosphere
- C) mesosphere
- D) thermosphere

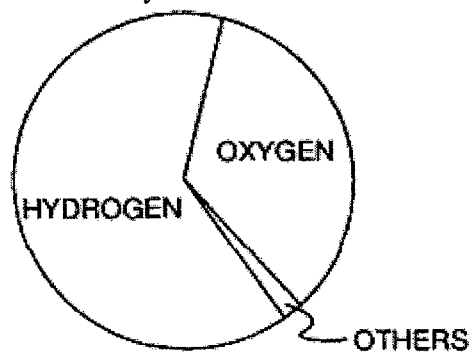
A 9 In which atmospheric layer is most water vapor found?

- A) troposphere
- B) stratosphere
- C) thermosphere
- D) mesosphere

B 10 Earth's hydrosphere is best described as the

- A) solid outer layer of Earth
- B) liquid outer layer of Earth
- C) magma layer located below Earth's stiffer mantle
- D) gaseous layer extending several hundred kilometers from Earth into space

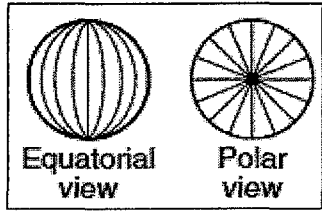
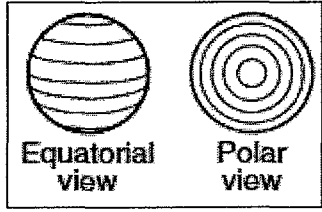
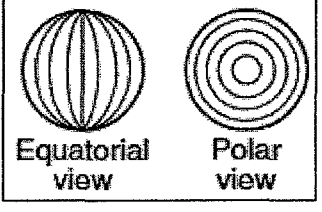
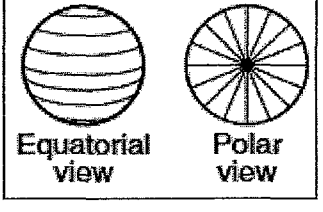
B 11 The graph below represents percentage of elements by volume.



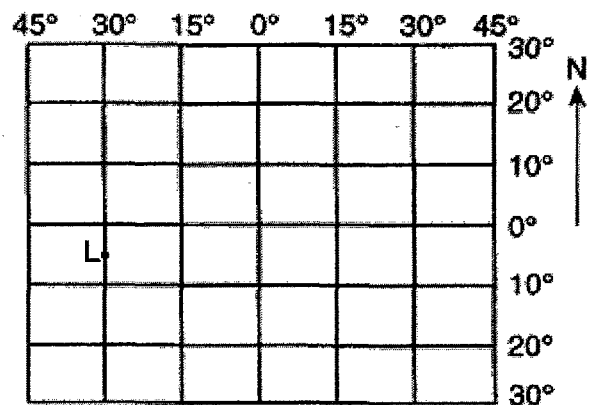
This graph best represents the elements of the Earth's

- A) lithosphere
- B) hydrosphere
- C) troposphere
- D) stratosphere

- B 12 Which two elements make up the greatest percentages by mass in Earth's crust?
 A) oxygen and potassium
B) oxygen and silicon
 C) aluminum and potassium
 D) aluminum and silicon
- C 13 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
- D 14 When the time of day for a certain ship at sea is 8 pm, the time of day at the Prime Meridian (0° longitude) is 3 p.m. What is the ship's longitude?
 A) 45° W B) 45° E
 C) 75° W D) 75° E
- B 15 On April 21, the altitude of *Polaris*, as viewed from a location in New York State, was measured as 41.3° . What will the altitude of *Polaris* be when viewed one month later, on May 21, from the same location?
 A) 23.5° B) 41.3°
 C) 66.7° D) 90°
- B 16 New York State's highest peak, Mt. Marcy, is located at approximately
 A) $44^\circ 10'$ N $74^\circ 05'$ W
B) $44^\circ 05'$ N $73^\circ 55'$ W
 C) $73^\circ 55'$ N $44^\circ 10'$ W
 D) $74^\circ 05'$ N $44^\circ 05'$ W
- B 17 Which New York State city is located at $42^\circ 39'$ N $73^\circ 45'$ W?
 A) Buffalo B) Albany
 C) Ithaca D) Plattsburgh
- A 18 If an observer on Earth views *Polaris* on the horizon, the observer is located at the
A) equator (0°)
 B) North Pole (90° N)
 C) Tropic of Cancer (23.5° N)
 D) Tropic of Capricorn (23.5° S)

- B 19 The lines on which set of views best represent Earth's latitude system?
 A) 
 B) 
 C) 
 D) 

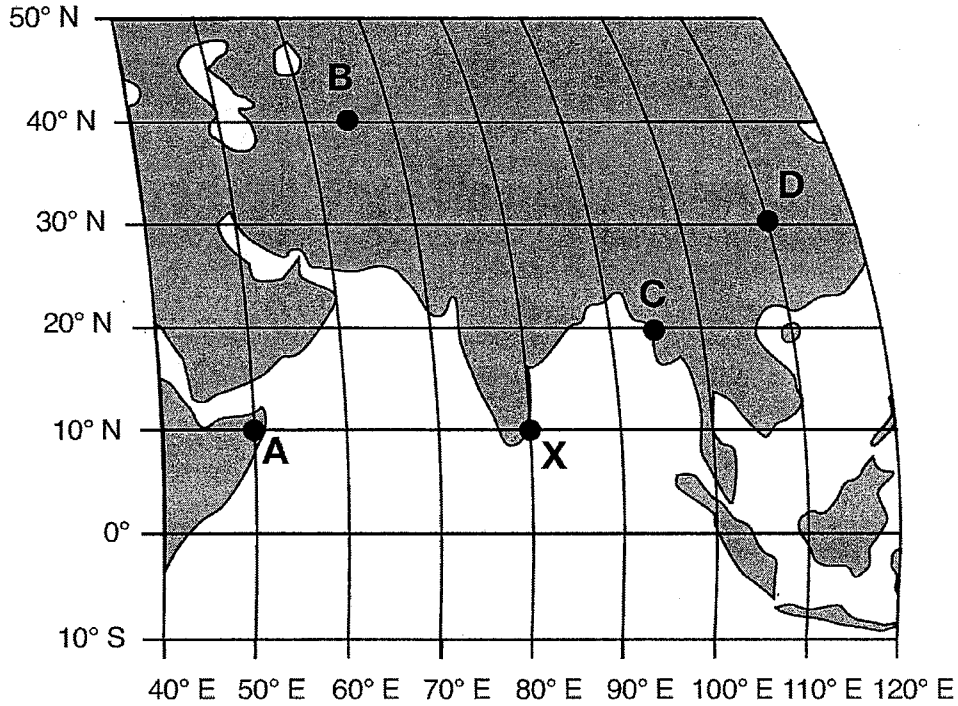
- D 20 The diagram below represents part of Earth's latitude-longitude system.



What is the latitude and longitude of point L?

- A) 5° E 30° N B) 5° W 30° S
 C) 5° N 30° E D) 5° S 30° W

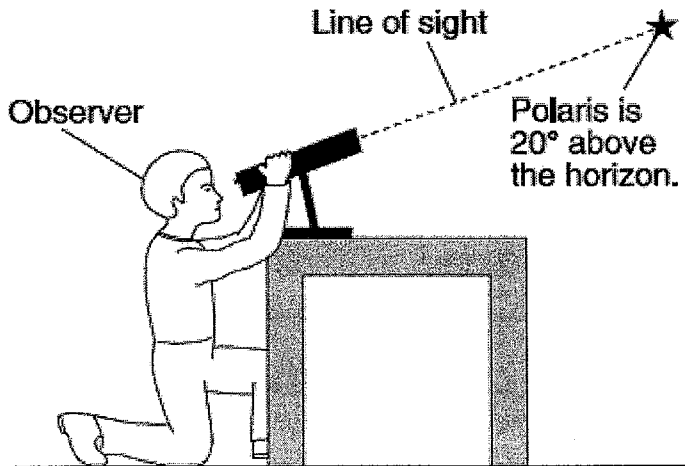
- B 21 The map below shows a portion of Earth's system of latitude and longitude and five surface locations labeled *A*, *B*, *C*, *D*, and *X*.



It is solar noon at location *X*. At which location will solar noon next occur?

- A) *A* **B) *B*** C) *C* D) *D*

- A 22 The diagram below shows an observer measuring the altitude of *Polaris*.



(Not drawn to scale)

What is the latitude of the observer?

- A) 20° N** B) 20° S C) 70° N D) 70° S

B 23 Which reference line passes through both the geographic North Pole and the geographic South Pole?

- A) 0° latitude
- B) 0° longitude
- C) Tropic of Cancer
- D) Tropic of Capricorn

B 24 As the altitude increases within Earth's stratosphere, air temperature generally

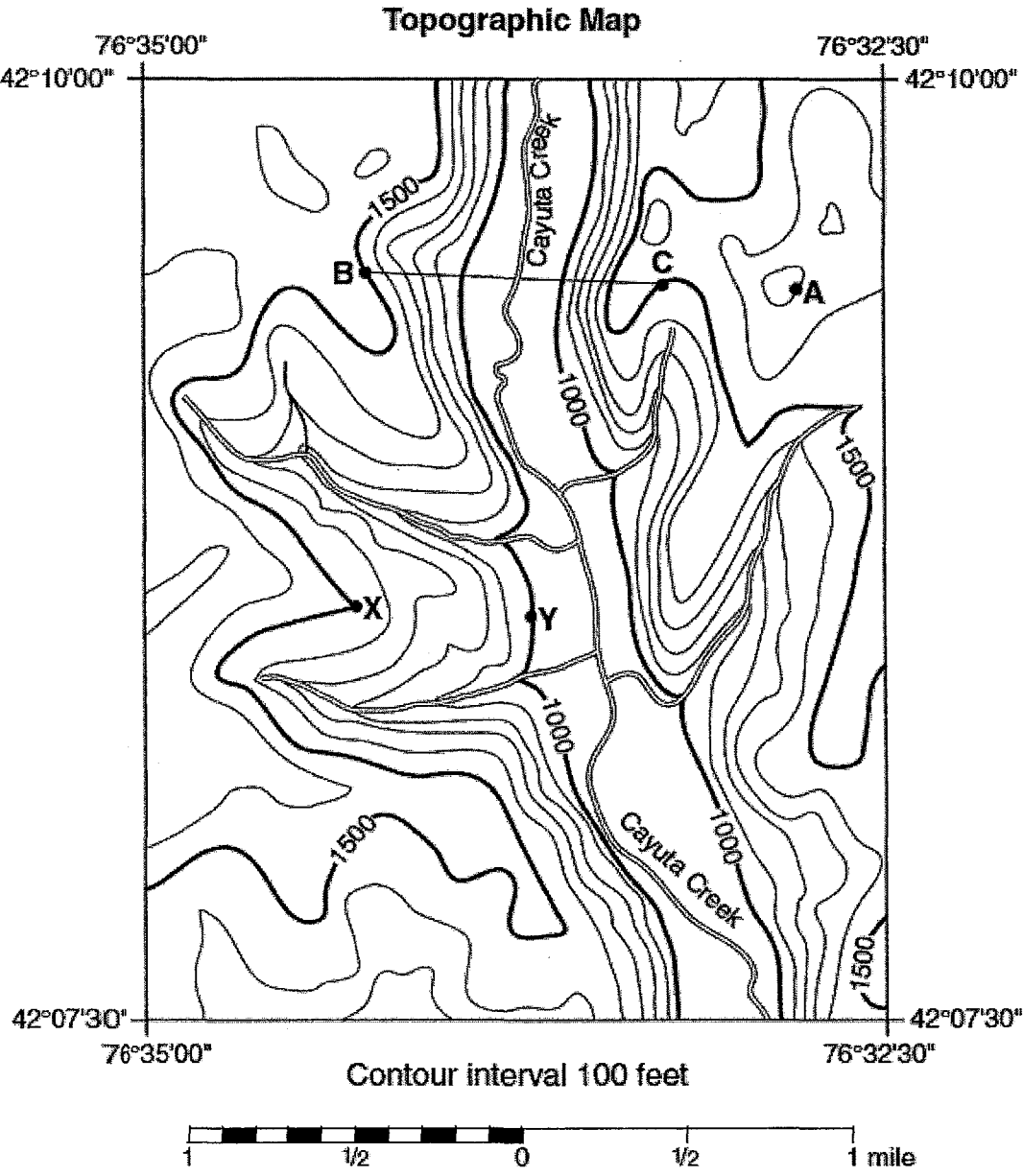
- A) decreases, only
- B) increases, only
- C) decreases, then increases
- D) increases, then decreases

D 25 Why do most clouds form in the troposphere?

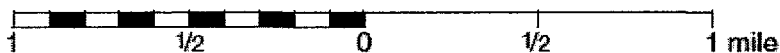
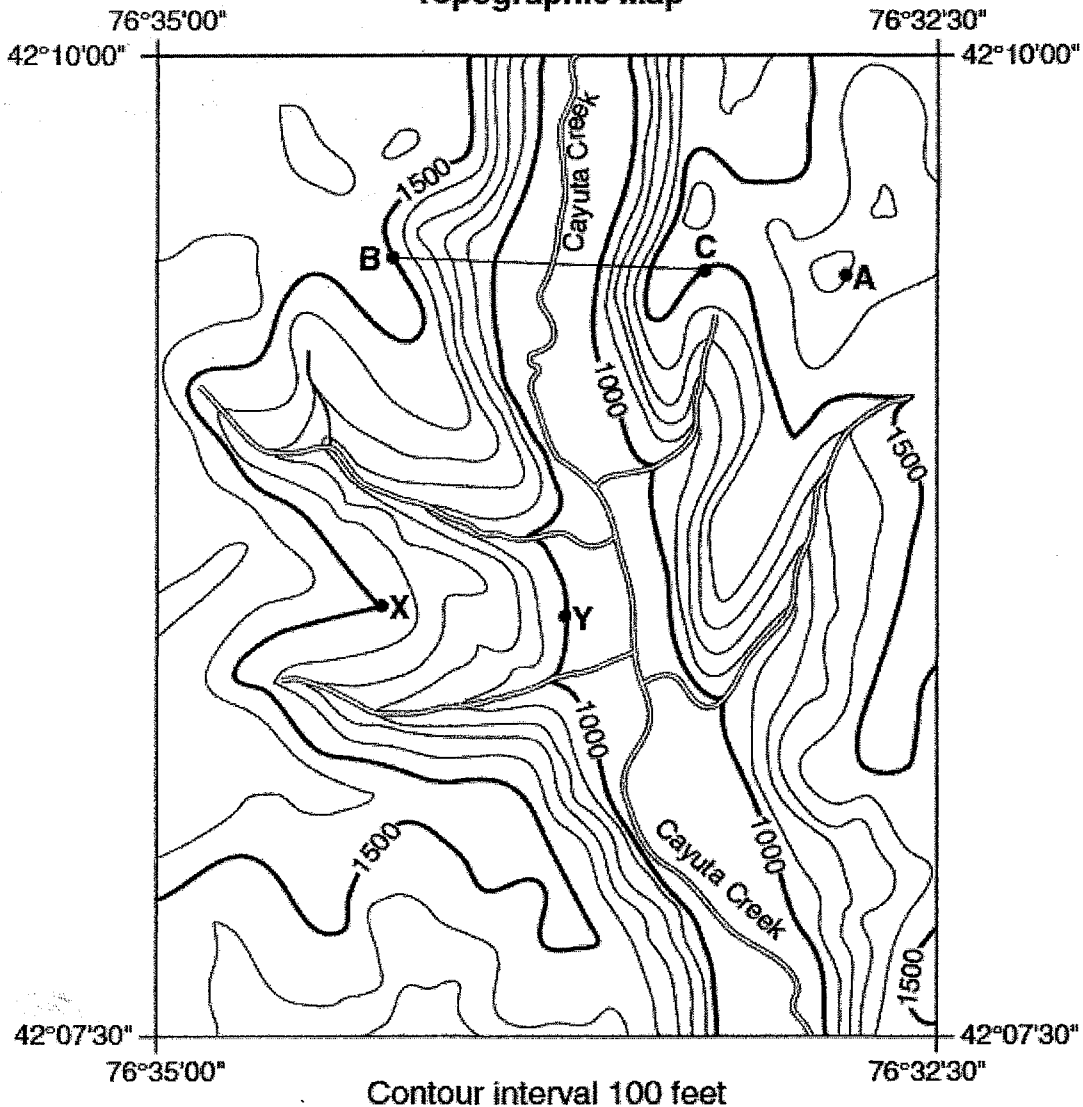
- A) Air pressure rises with increasing altitude
- B) The dewpoint is too high in the other layers of the atmosphere.
- C) The other layers of the atmosphere are too cold to contain water.
- D) The lowest 11 km of the atmosphere contains almost all of the atmospheric water vapor.

Key

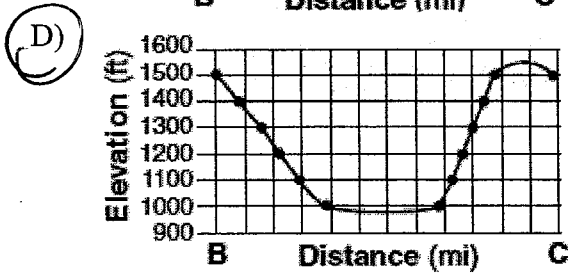
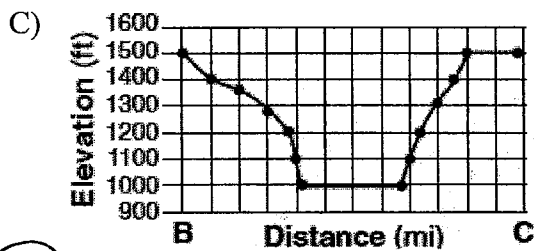
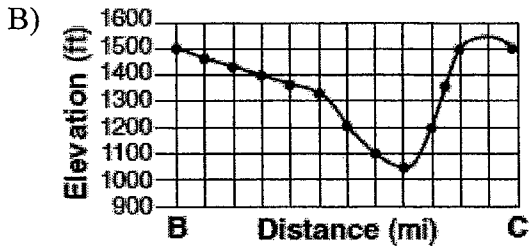
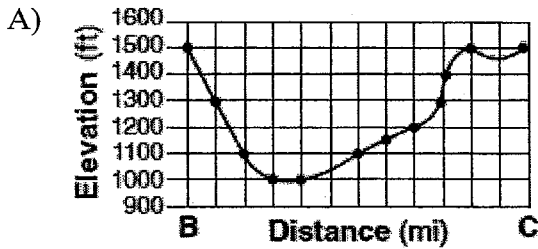
Base your answers to questions 1 through 3 on the maps below. Points A, B, C, X, and Y are locations on the topographic map. The small map identifies the New York State region shown in the topographic map.



Topographic Map



D 1 Which graph best represents the profile from point B to point C?



A 2 What is the elevation of point A on the topographic map?

- (A) 1,700 ft B) 1,650 ft C) 1,600 ft D) 1,550 ft

D 3 What is the approximate gradient between point X and point Y?

- A) 100 ft/mi B) 250 ft/mi C) 500 ft/mi (D) 1,000 ft/mi

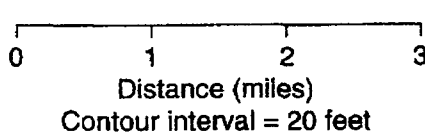
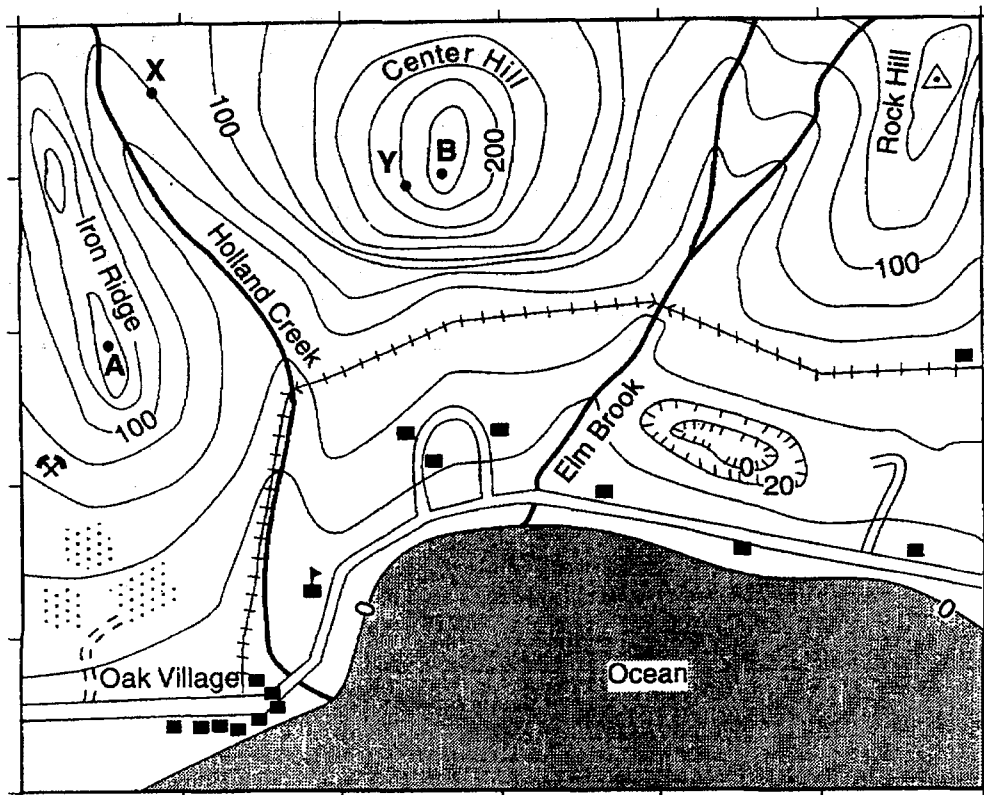
C 4 A stream begins at an elevation of 2,000 meters and ends in a lake at an elevation of 400 meters. The lake is 320 kilometers from the stream's source. What is the average gradient of the stream?

- A) 1.6 m/km B) 2.0 m/km
(C) 5.0 m/km D) 8.0 m/km

B 5 A contour map shows two locations, X and Y, 5 kilometers apart. The elevation at location X is 800 meters and the elevation at location Y is 600 meters. What is the gradient between the two locations?

- A) 12 m/km (B) 40 m/km
C) 120 m/km D) 160 m/km

Base your answers to questions 6 through 10 on the topographic map below. Points A, B, X, and Y are locations on the map. Elevations are shown in feet.

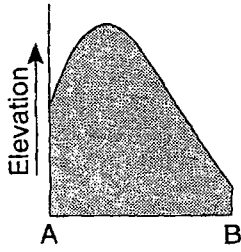


Symbols Key	
	Triangulation point
	School
	Mine
	House
	Depression contours
	Railroad
	Roads

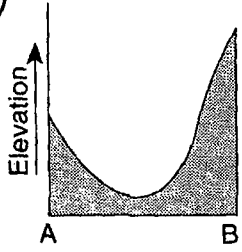
- A 6 In which general direction is Elm Brook flowing?
 (A) southwest B) southeast C) northwest D) northeast
- C 7 What is the approximate elevation of the triangulation point on the top of Rock Hill?
 A) 124 ft B) 139 ft (C) 144 ft D) 169 ft

B 8 Which diagram best represents the topographic profile along a straight line from point A to point B?

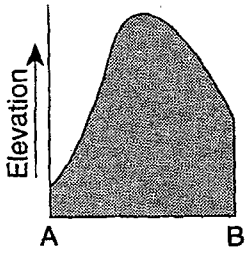
A)



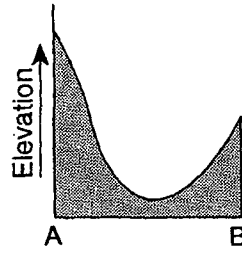
(B)



C)



D)



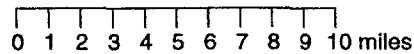
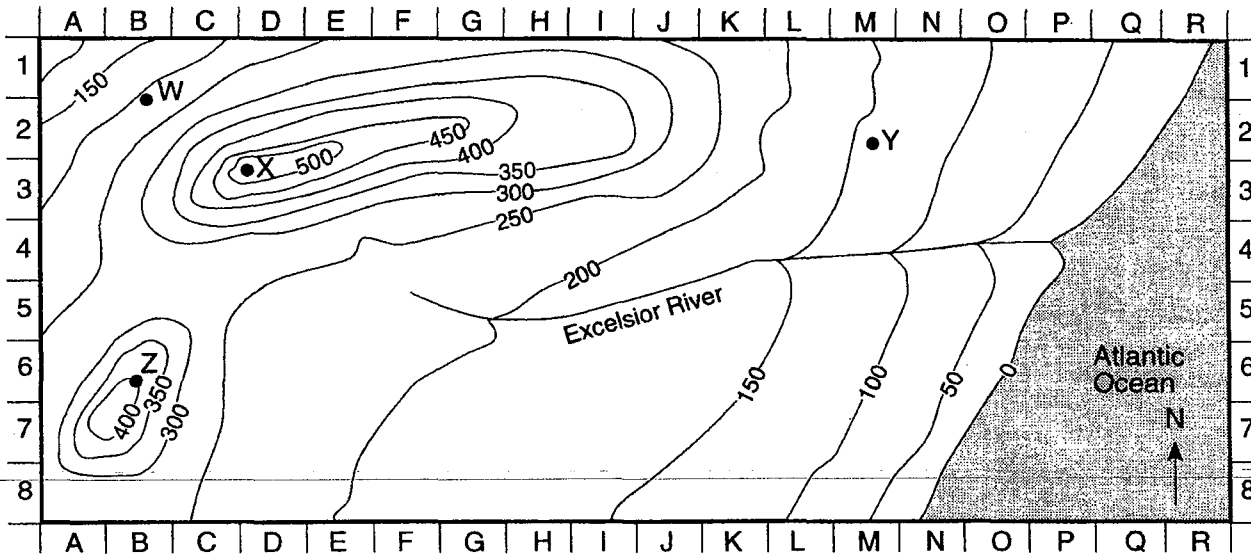
B 9 Which side of Center Hill has the steepest slope?

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

C 10 What is the average gradient along a straight line between point X and point Y?

- A) 30 ft/mi B) 40 ft/mi (C) 60 ft/mi D) 70 ft/mi

Base your answers to questions 11 through 15 on the topographic map below that represents a location in North America. A grid system of letters and numbers along the edges of the map is provided to assist in finding locations. Elevations are expressed in feet.



B 11 What is the approximate elevation at grid location 7-I?

- A) 140 ft (B) 170 ft C) 200 ft D) 230 ft

B 12 What is a possible elevation at point *X* (grid location 3-D)?

- A) 488 ft B) 548 ft C) 558 ft D) 598 ft

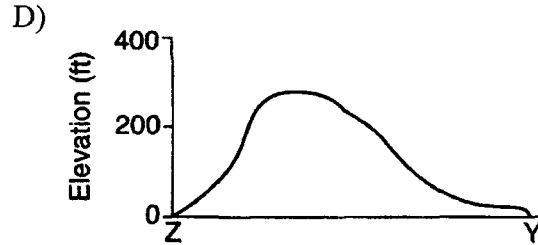
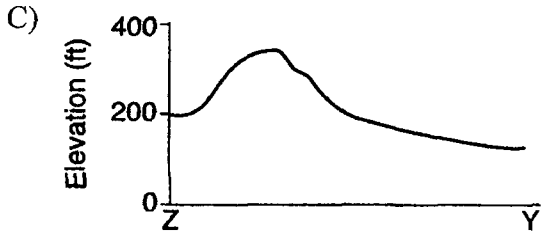
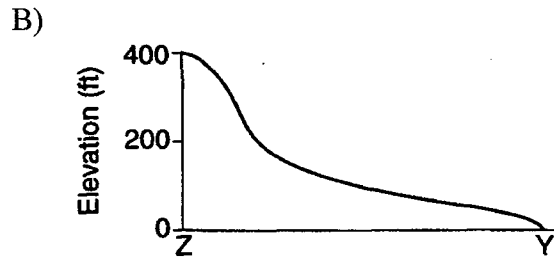
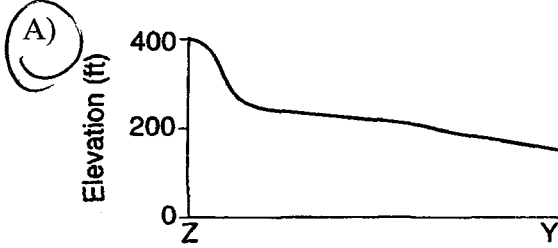
D 13 If a person at point *W* (grid location 2-B) travels uphill, in which direction is the person traveling?

- A) northwest B) northeast C) southwest D) southeast

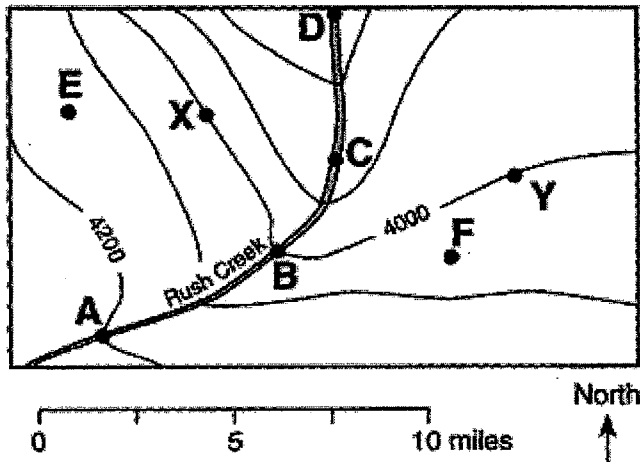
B 14 What is the gradient of the entire length of the Excelsior River?

- A) 0.1 ft/mi B) 11 ft/mi C) 24 ft/mi D) 48 ft/mi

A 15 Which profile best represents the topography along a straight line from point *Z* (6-B) to point *Y* (2-M)?



Base your answers to questions 16 through 19 on the topographic map below. Points A, B, C, D, E, F, X, and Y are locations on the map. Elevation is measured in feet.



C 16 What is the contour interval used on this map?

- A) 20 ft
- B) 50 ft
- C) 100 ft
- D) 200 ft

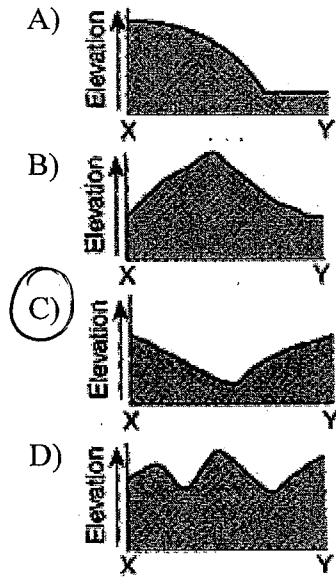
A 17 Which locations have the greatest difference in elevation?

- A) A and D
- B) B and X
- C) C and F
- D) E and Y

B 18 Between points C and D, Rush Creek flows toward the

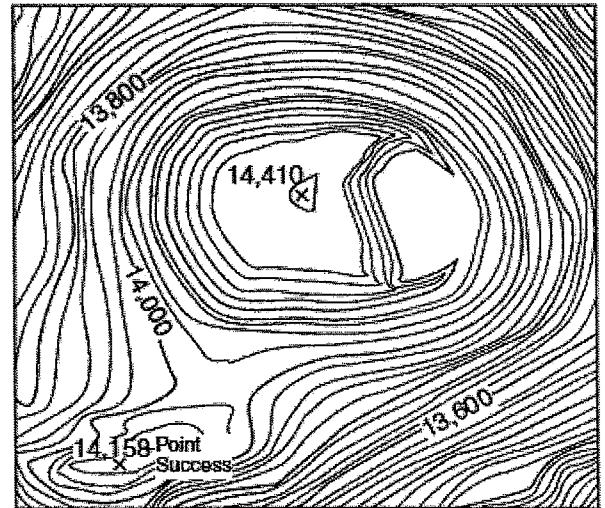
- A) north
- B) south
- C) east
- D) west

C 19 Which diagram best represents the profile along a straight line between points X and Y?



B 20 A topographic map of Mt. Rainier in Washington State is shown below.

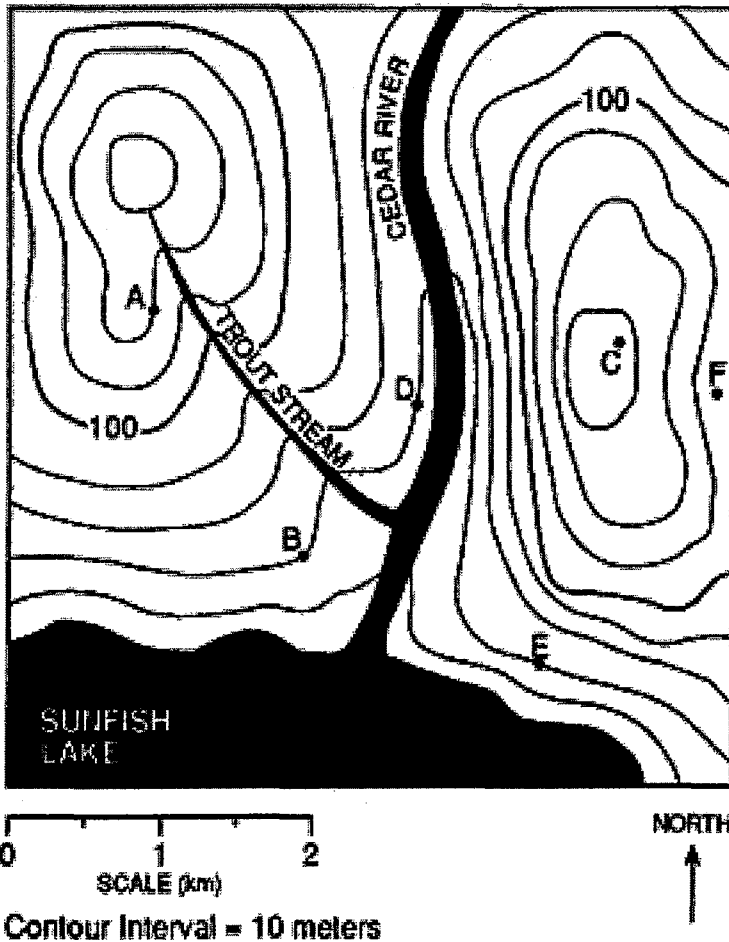
Mt. Rainier



What is the contour interval of the map?

- A) 20 ft
- B) 40 ft
- C) 100 ft
- D) 200 ft

Base your answers to questions 21 through 25 on the contour map below. Points *A* through *F* represent locations on the map.



- C 21 What is the most likely elevation of the surface of Sunfish Lake?
 A) 151 m B) 140 m C) 55 m D) 28 m
- B 22 Which statement about hill *C* is best supported by the map?
 A) Hill *C* is located approximately 2 km west of Cedar River.
B) The steepest slope of hill *C* is on the western side.
 C) Hill *C* has been shaped by glaciers.
 D) The highest possible elevation of hill *C* is 179 m.
- C 23 If no elevation values were given, which general rule could be used to establish that Cedar River flows into Sunfish Lake?
 A) Rivers shown on maps generally flow southward.
 B) Rivers always flow toward large bodies of water.
C) Contour lines bend upstream when crossing a river.
 D) A large body of water is generally the source of water for a river.
- B 24 Which location has the same elevation as location *D*?
 A) *A* B) *E* C) *C* D) *F*