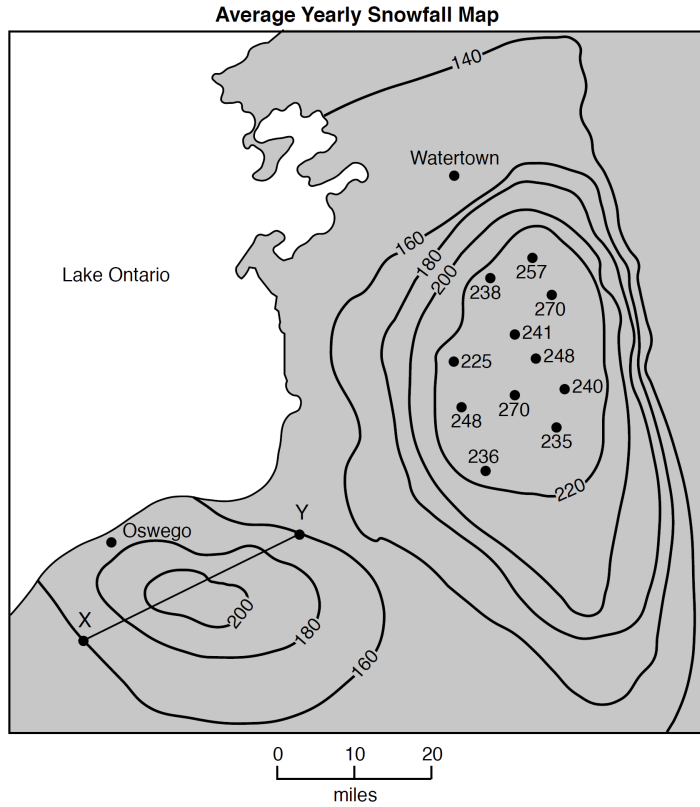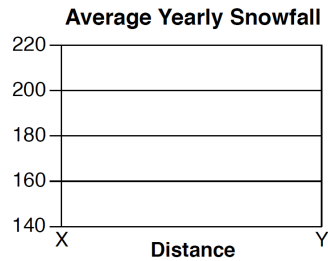1. Base your answer to the following question on the snowfall map below and on your knowledge of Earth science. The snowfall map shows some average yearly snowfall values, measured in inches, recorded for a portion of New York State. Some average yearly snowfall isolines have been drawn. Line *XY* is a reference line on the map. The cities of Watertown and Oswego are shown on the map.

**Average Yearly Snowfall Map**

On the grid below, construct a profile of the average annual snowfall along line *XY* by plotting the value of each isoline that crosses line *XY*. Connect *all six* plots with a line to complete the profile.

Average Yearly Snowfall

2. Base your answer to the following question on the map and passage below and on your knowledge of Earth science. The map shows isolines that represent the thickness of a portion of the Greenland Ice Sheet in meters (m). Letters *A* and *B* represent points on the ice sheet's surface.

**Thickness of Greenland Ice Sheet**
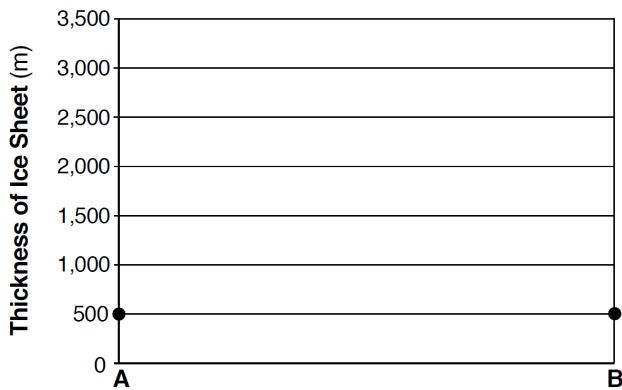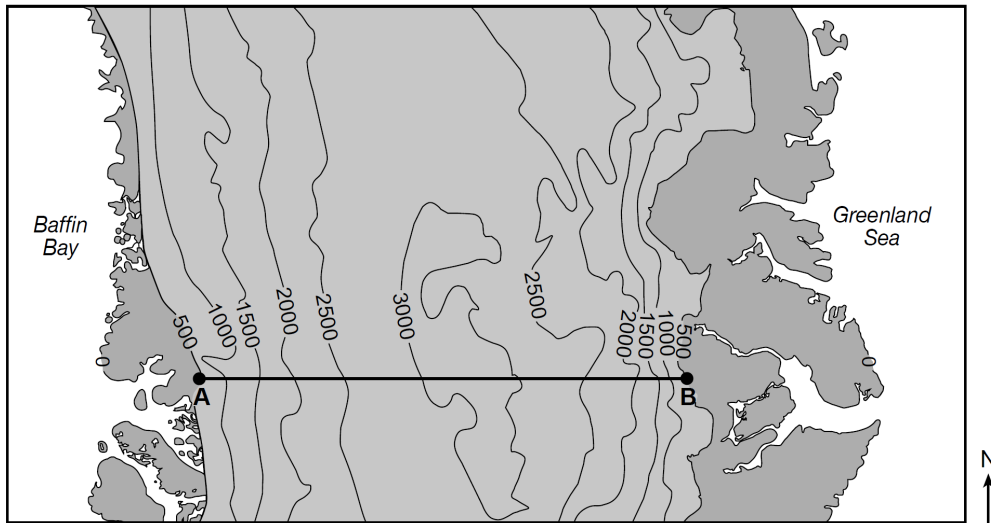
Greenland Ice Sheet

   The Greenland Ice Sheet is a vast body of ice covering roughly 80 percent of the surface of Greenland. The ice sheet is almost 2400 kilometers long in a north-south direction. The ice sheet, consisting of layers of snow compressed over more than 100,000 years, contains a valuable record about Earth's past climates. The ice sheet glaciers continue to fl ow seaward and deposit sediment, but global warming has affected them. Warmer air temperatures have caused increased melting, resulting in a thinning of the ice sheet and faster glacial movement at the ice sheet edges.

On the grid, construct a profile along line *AB* by plotting the thickness of the ice sheet where each isoline crosses line *AB*. Thicknesses of the ice sheet at *A* and *B* have been plotted on the grid. Connect *all twelve* plots with a line from *A* to *B* to complete the profile.

3. Base your answer to the following question on the topographic map and on your knowledge of Earth science. Points *A* and *B* represent locations on Earth's surface. Elevations are shown in feet. The 50-ft and 55-ft contour lines are *not* shown on the map.

On the map, draw the 50-ft and 55-ft contour lines. The contour lines must extend to the edges of the map.

Base your answers to questions **4** and **5** on the topographic map in your answer booklet and on your knowledge of Earth science. Points *A*, *B*, *C*, and *D* represent locations on Earth's surface. Elevations are measured in meters.
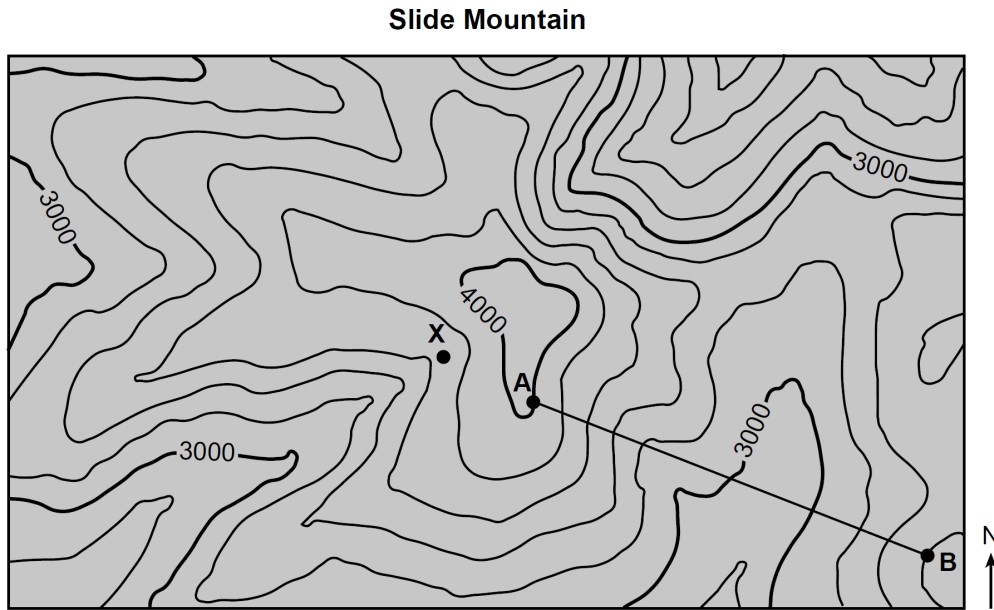

Contour Interval = 100 meters
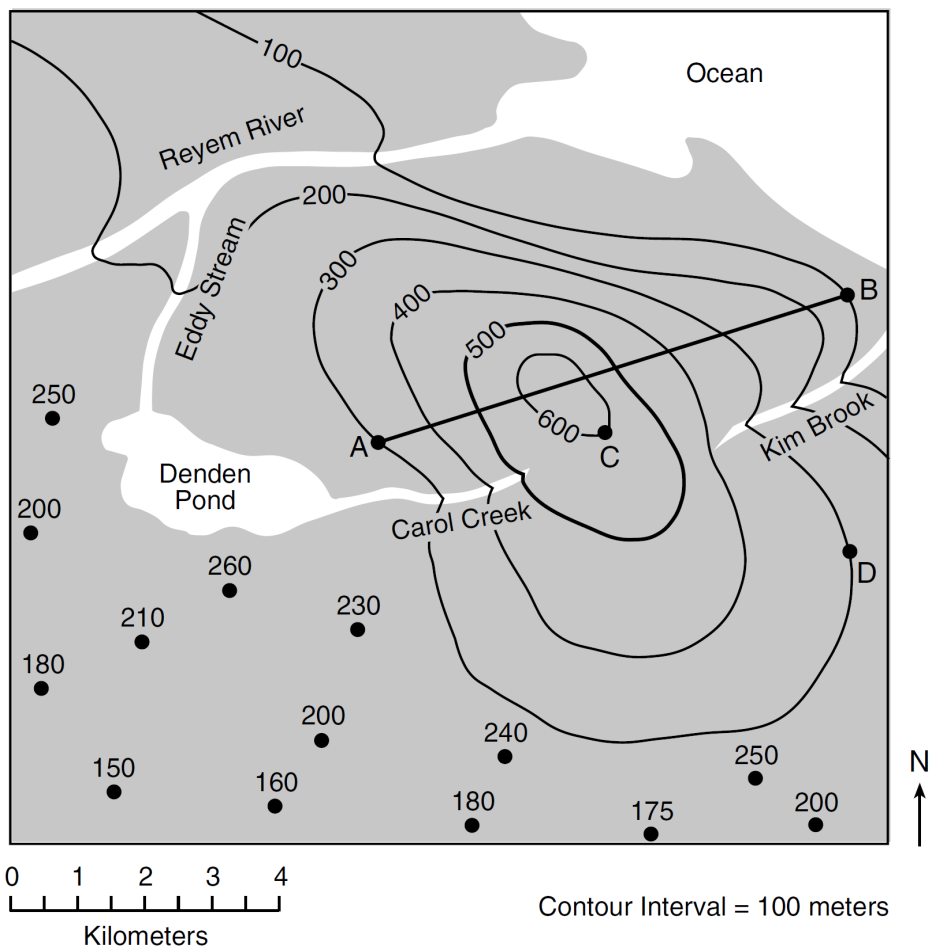
4. On the grid construct a topographic profile along line *AB* by plotting the elevation of each contour line that crosses *AB*. The elevations of points *A* and *B* have been plotted on the grid. Connect all ten plots with a line from *A* to *B* complete the profile.
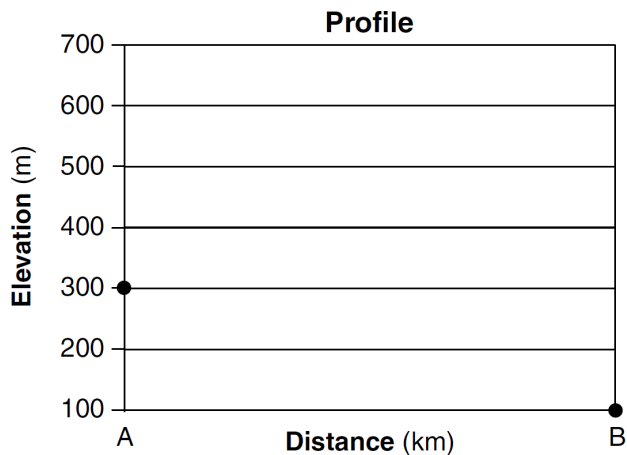
5. On the map draw the 200-meter contour line in the southern portion of the map. Extend the contour line to the edges of the map.

_____

6. Base your answer to the following question on the topographic map below and on your knowledge of Earth science. The map is centered on the peak of New York State's Slide Mountain at 42° North. Points A, B, and X represent locations on the map. Line AB is a reference line on the map. Elevations are shown in feet.

Slide Mountain

Contour interval = 200 feet

On the grid below, construct a topographic profile along line AB by plotting the elevation of each contour line that crosses line AB. Points A and B have already been plotted. Connect all ten plots with a line, starting at A and ending at B, to complete the profile.
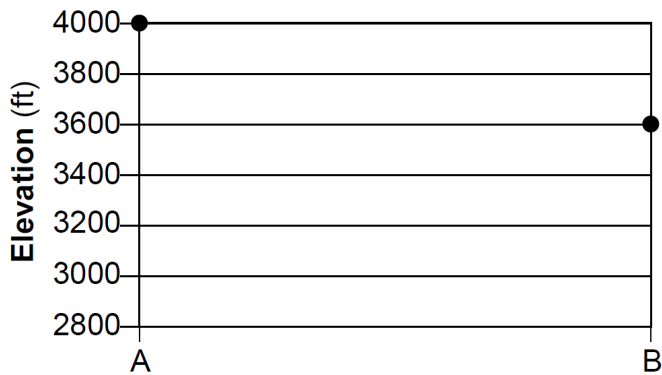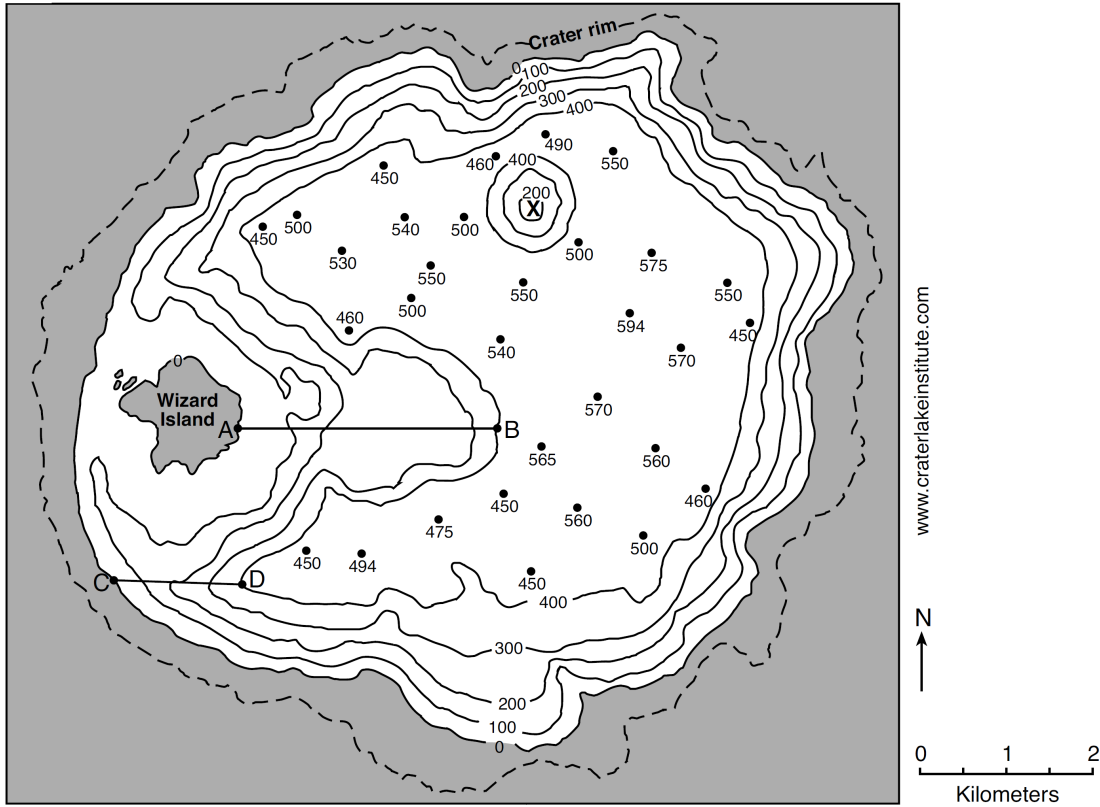
7. Base your answer to the following question on the passage, map, and field map below, and on your knowledge of Earth science. The map shows the location of Crater Lake in Oregon in the western United States. The field map shows lake depths and some isolines in Crater Lake recorded in meters. Line *AB* and line *CD* are reference lines. Letter *X* represents a location on the lake bottom.

Crater Lake

   Crater Lake is the deepest lake in the United States. The lake formed in the crater at the top of volcanic Mount Mazama after it exploded in a violent eruption approximately 7700 years ago. The rim of the crater is approximately 2300 meters (7500 feet) above sea level and is mostly composed of the rock andesite. The average yearly air temperature at the lake is 38°F, and snowfall often occurs from October through June. Hydrothermal activity (heating of the water) is ongoing under the lake, indicating that this region is still volcanically active.
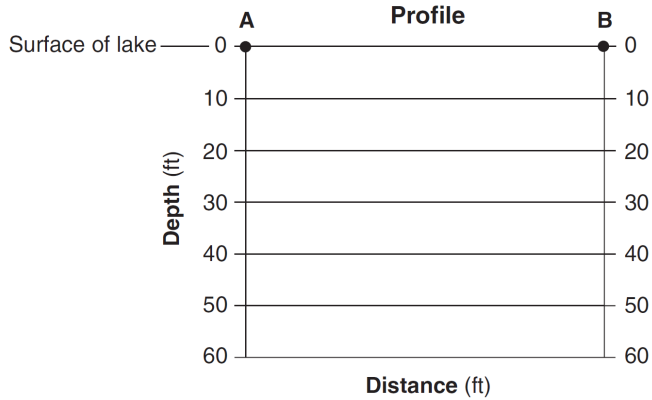
Field Map of Crater Lake

On the grid below, construct a profile along line *AB* by plotting the lake depth of each isoline that crosses line *AB*. Connect all plots with a line to complete the profile.
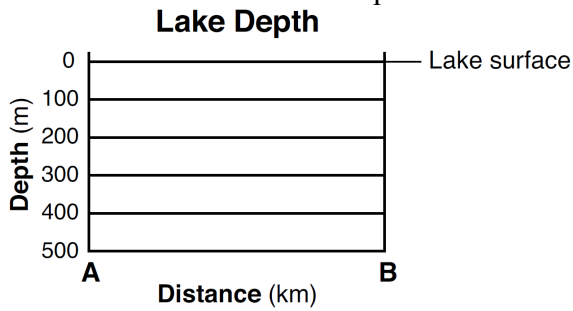
Lake Depth

8. Base your answer to the following question on the field map in your answer booklet and on your knowledge of Earth science. The map shows the depth of Cuba Lake, located in New York State at latitude 42°14' N, longitude 78°18' W. Isoline values indicate water depth, in feet. Points *A* and *B* represent locations on the shoreline of Cuba Lake. Points *W, X, Y,* and *Z* represent locations on the bottom of the lake. The 30-foot isoline has been partially drawn.

On the grid below, construct a profile of the bottom of Cuba Lake from point *A* to point *B*. Plot each point where an isoline showing depth is crossed by line *AB*. Connect the plots with a line, starting at *A* and ending at *B*, to complete the profile.

Profile grid: Surface of lake — A at 0, B at 0. Depth (ft) axis marked 0, 10, 20, 30, 40, 50, 60. Distance (ft) along horizontal axis.

9. Base your answer to the following question on the topographic map below and on your knowledge of Earth science. Point *A* represents a location on Earth's surface. Lines *BC* and *XY* are reference lines on the map. Points *D, E, F,* and *G* represent locations along Coe Creek. Elevations are shown in feet.
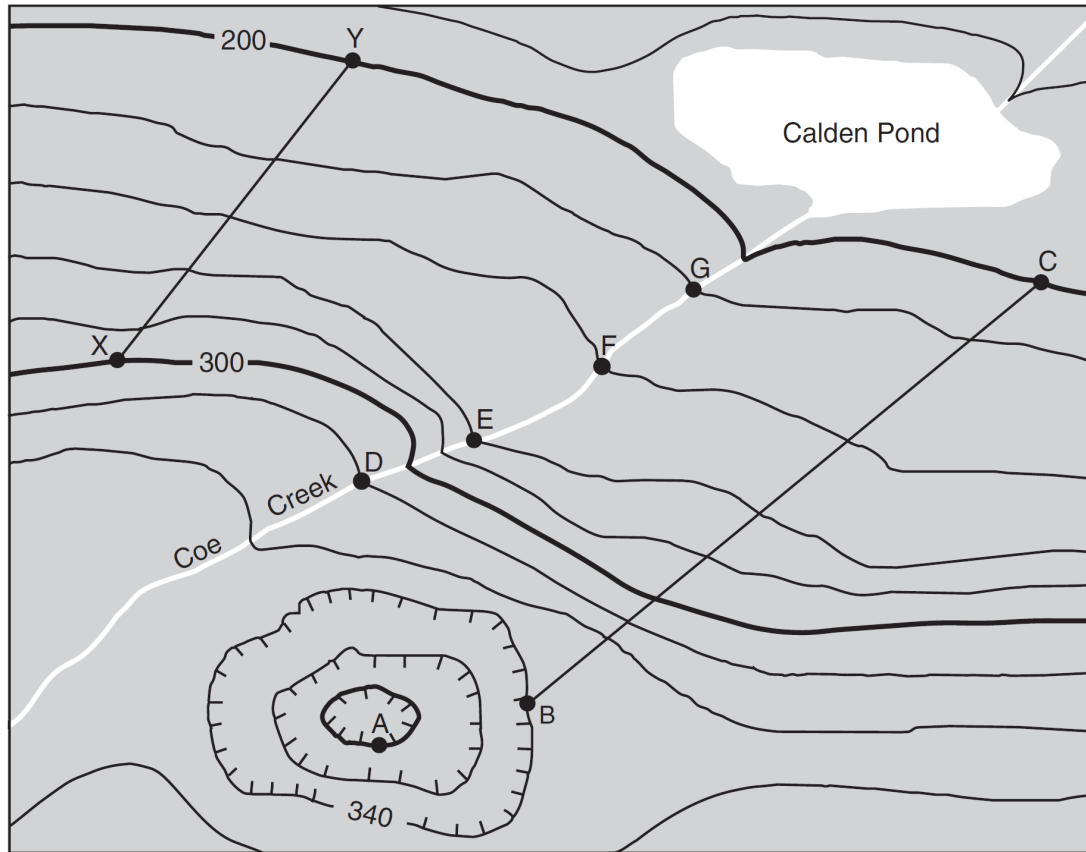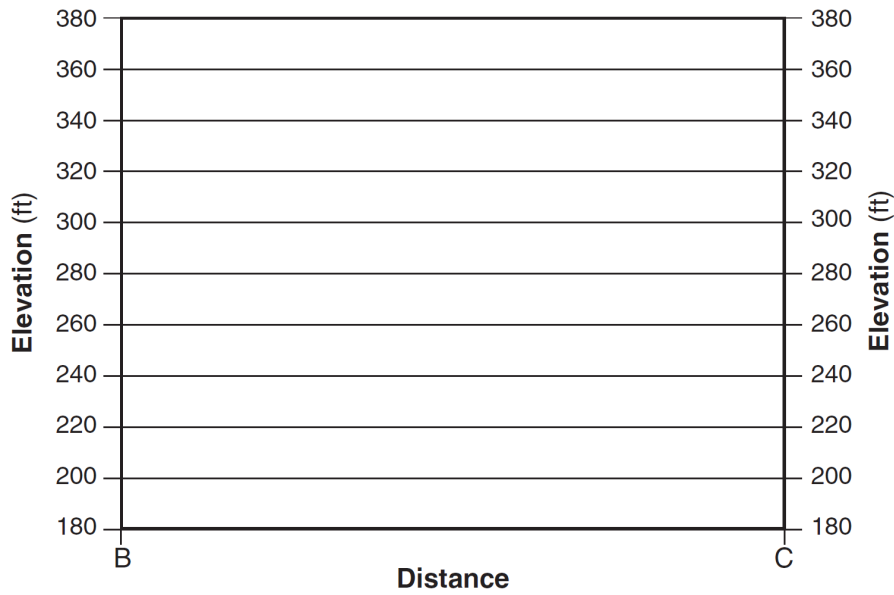

Contour interval = 20 ft

| Key |
| --- |
| ⌢⊤⊤⊤⊤ Depression contour line |

On the grid below, construct a topographic profile of the land surface along the line from point B to point C. Plot the elevation of *each* contour line that crosses line BC. Connect *all nine* plots with a line to complete the profile.
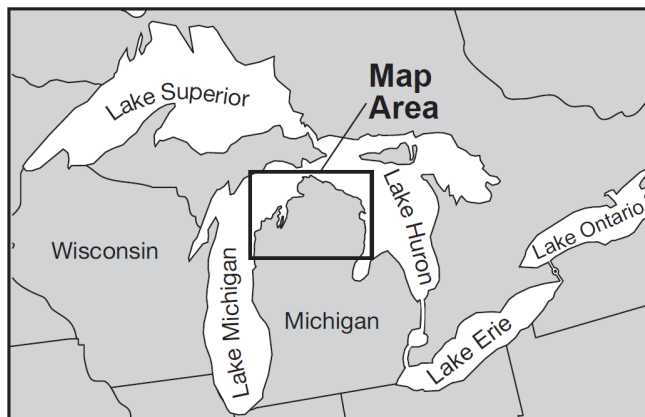
10. Base your answer to the following question on the maps below and on your knowledge of Earth science. The snowfall map shows isolines of average annual snowfall, measured in inches, across part of Michigan between two of the Great Lakes. Letters *A* through *C* represent locations on Earth's surface. The snowfall map is an enlargement of the map area outlined on the following Great Lakes regional map.
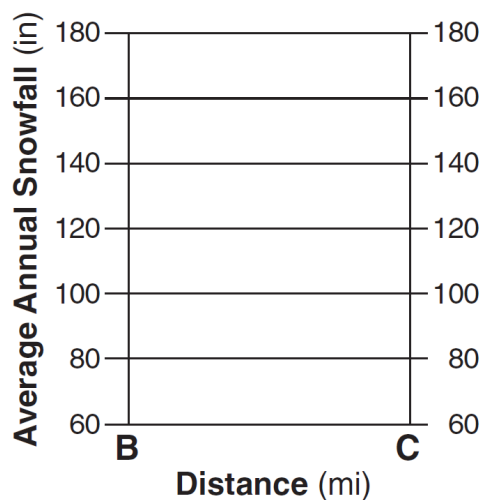
Average Annual Snowfall
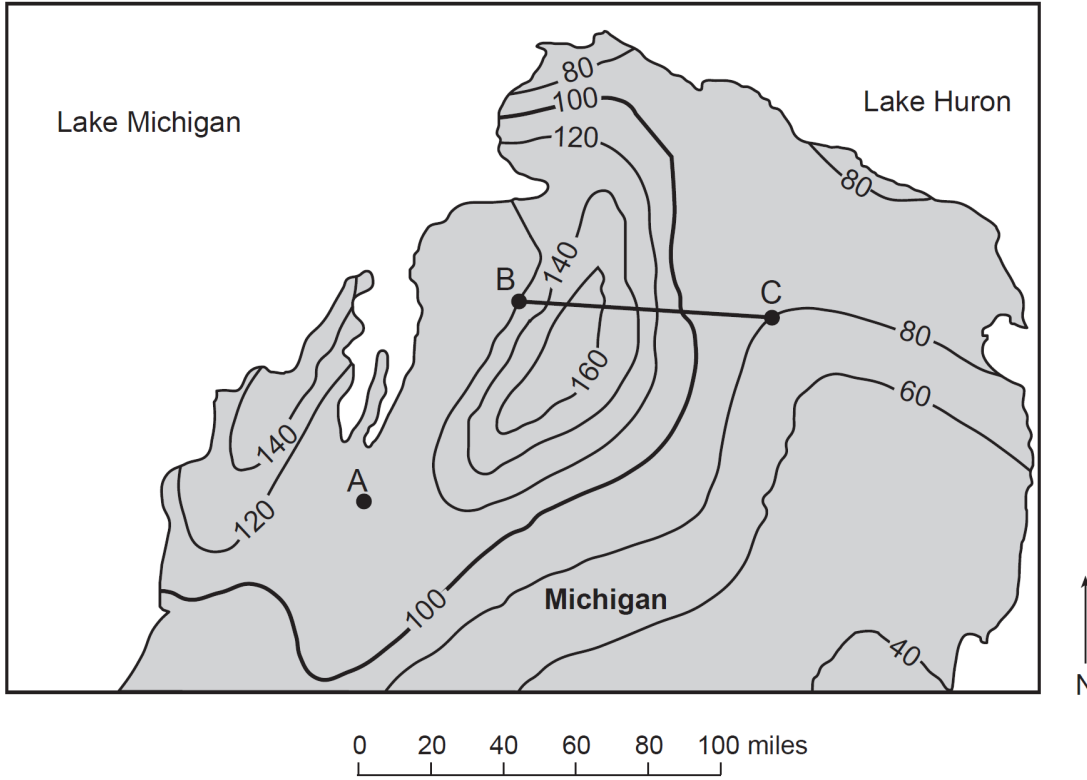
Great Lakes Regional Map

On the grid, construct a profile of the average annual snowfall along line *BC* by plotting the value of *each* isoline that crosses line *BC*. Connect *all eight* plots with a line to complete the profile.
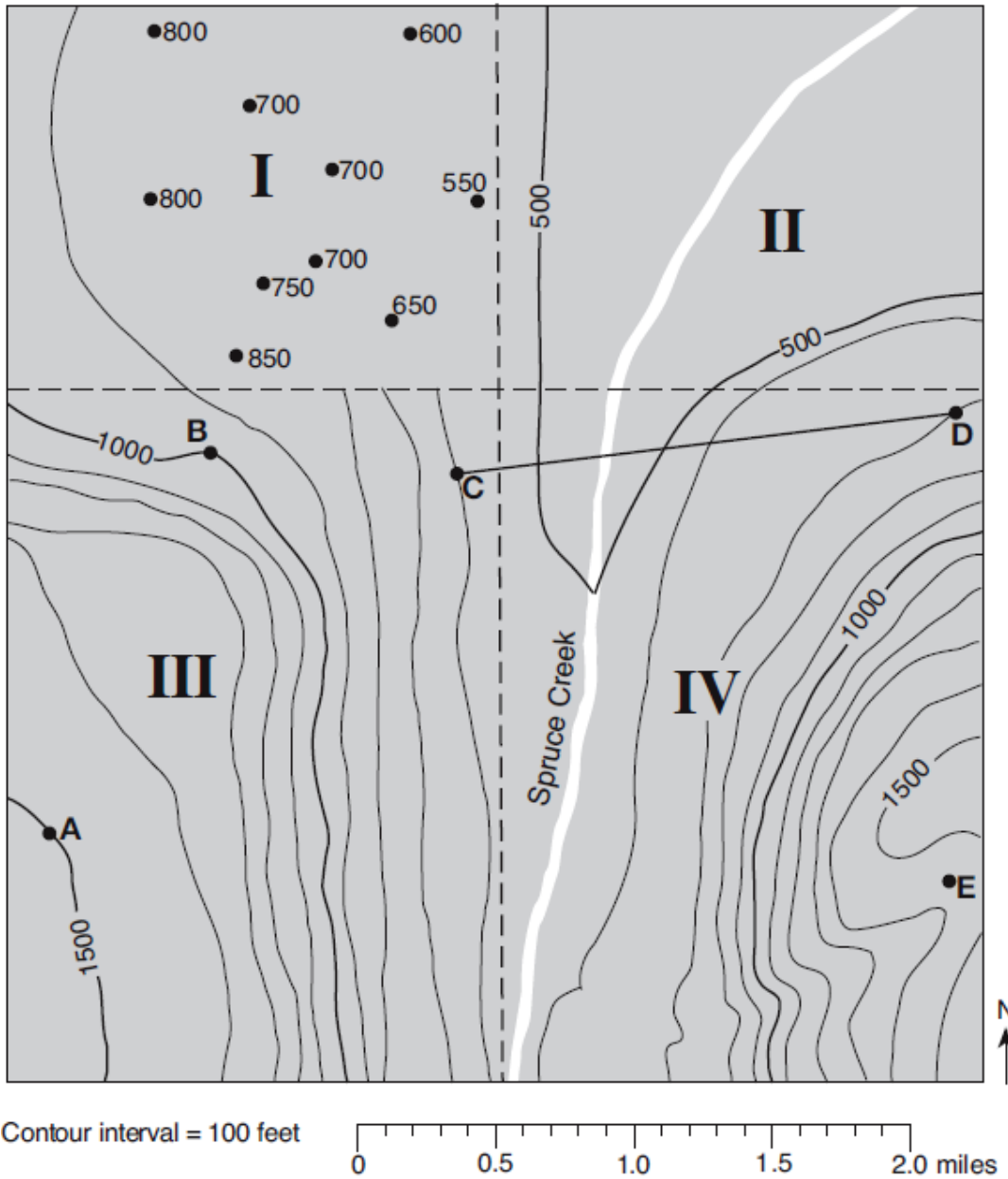

11. Base your answer to the following question on the topographic map below and on your knowledge of Earth science. Some contour lines have been drawn. Line *AB* is a reference line on the map.
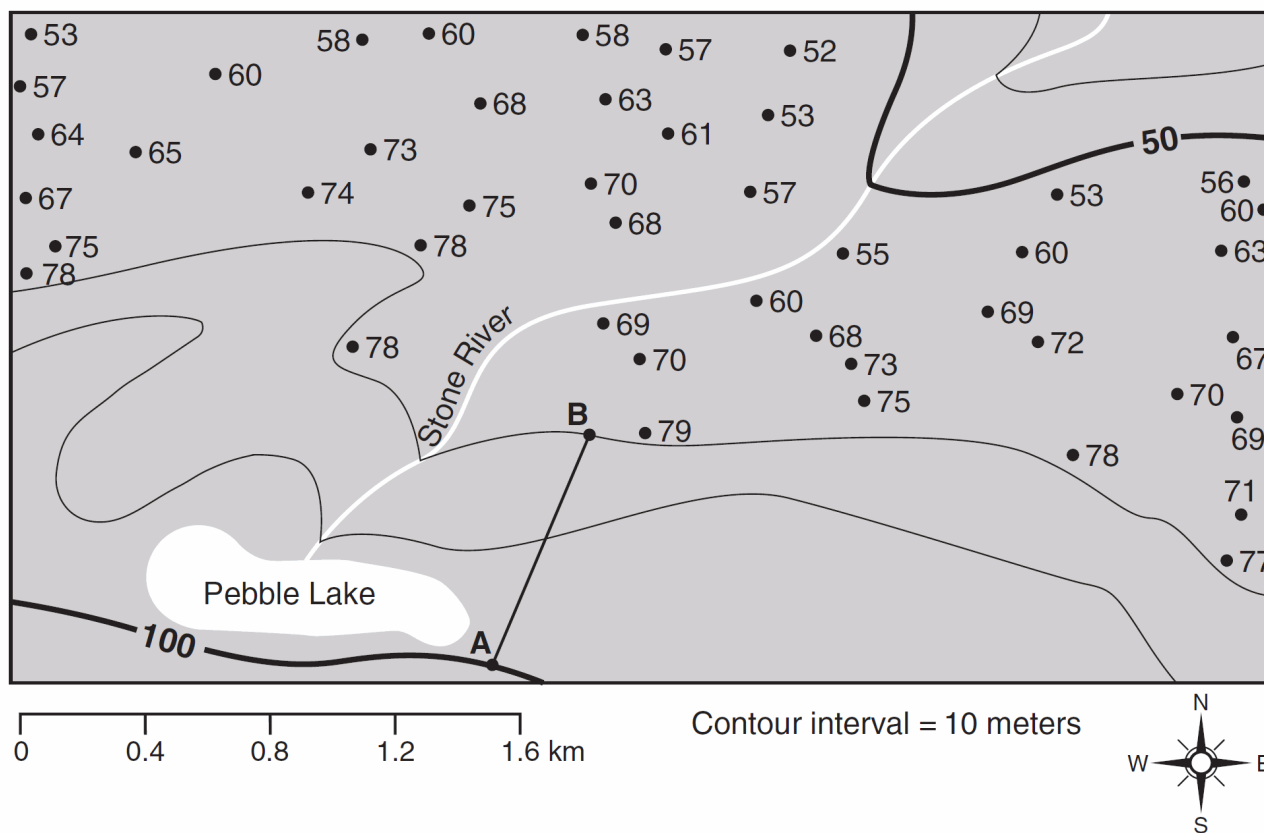
On the map, draw the 60-meter and 70-meter contour lines. The contour lines should extend to the edges of the map.

12. Base your answer to the following question on the topographic map and on your knowledge of Earth science. Dashed lines separate the map into sections I, II, III, and IV. Letters *A* through *E* represent locations on Earth's surface. The points in section I represent elevations in feet.

Contour interval = 100 feet

0   0.5   1.0   1.5   2.0 miles

On the map complete the 600-ft, 700-ft, and 800-ft contour lines in section I. Extend the lines to the edge of the map.
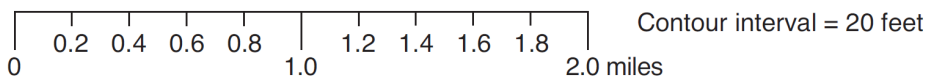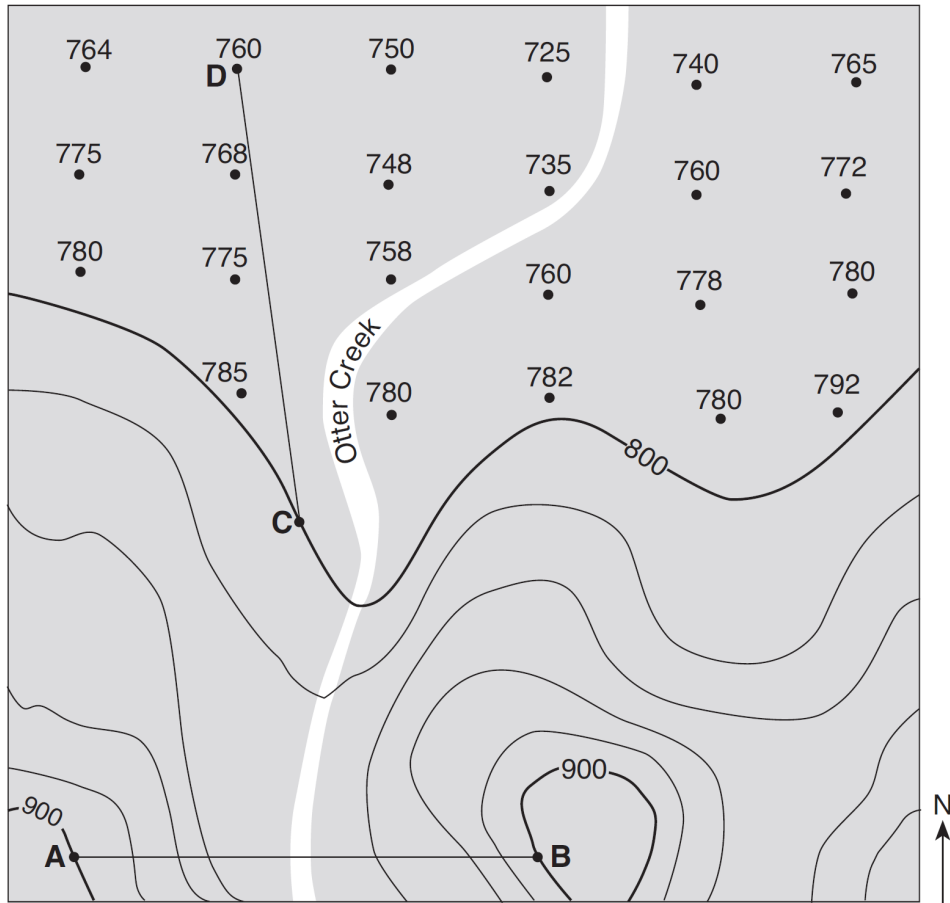
13. Base your answer to the following question on the topographic map of Hawaii below and on your knowledge of Earth Science. Points *A* and *B* represent surface locations on the island. Land elevations and Pacific Ocean depths are shown in meters.

Hawaii
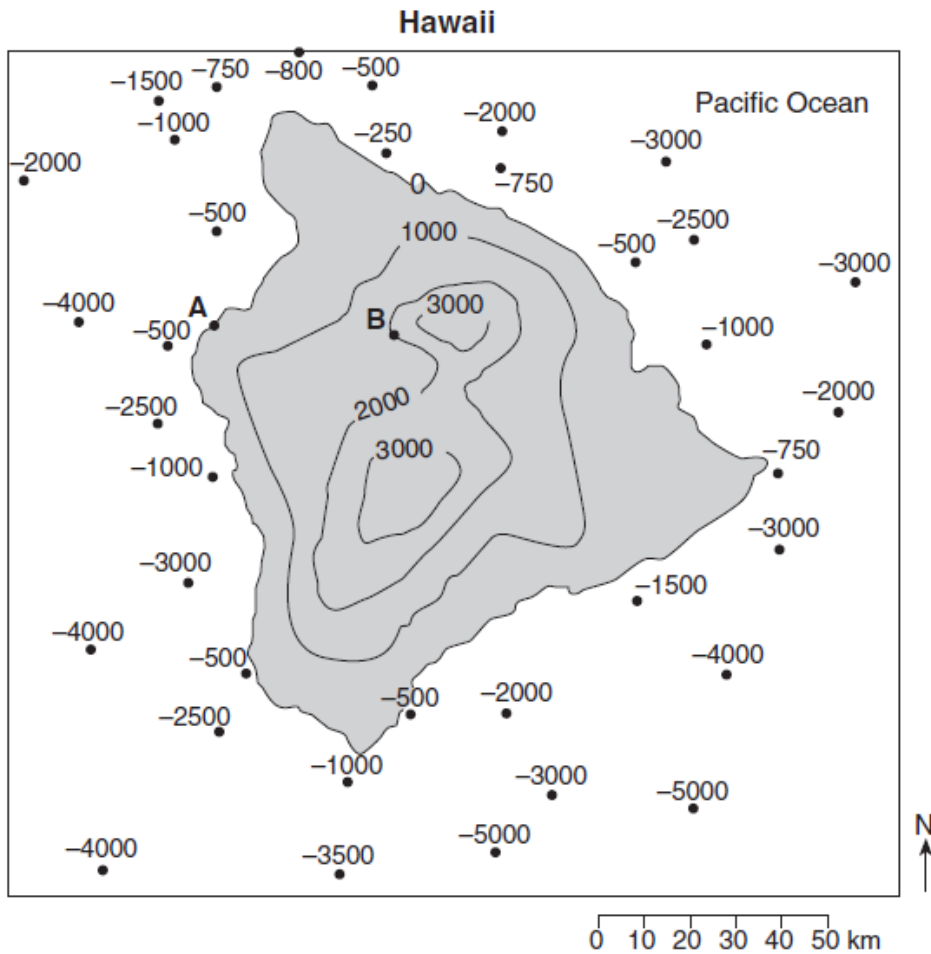
On the map, draw the –1000-meter ocean-depth isoline. Extend the isoline to the edge of the map.

14. Base your answer to the following question on the map below, which shows elevations in feet at various points. The southern part of the map has contour lines representing elevations at 20-foot intervals. Lines *AB* and *CD* are reference lines on the map.

Contour interval = 20 feet

On the map, draw contour lines for the 780-ft, 760-ft, and 740-ft elevations. Extend your contour lines to the edges of the map.

15. Base your answer to the following question on the map below, which shows the snowfall from the fall of 1976 through the spring of 1977, measured in inches, for most of New York State. The 200-inch snowfall isolines are shown on the map.
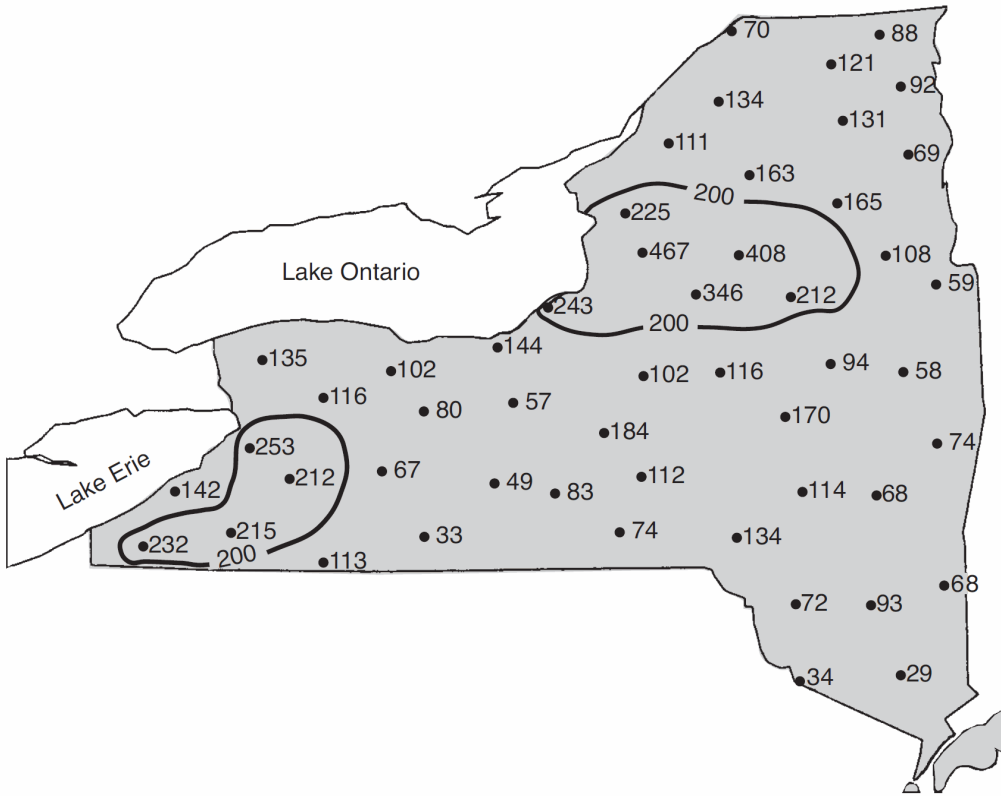
On the map above, draw the 100-inch snowfall isoline. Extend the isoline to the edges of New York State.

16. Base your answer to the following question on the map below. The map shows the precipitation totals, in inches, from January 2003 through May 2003 for the North Carolina locations represented by dots. Precipitation totals for locations *A* and *B* are recorded on the map. The towns of Newport and Beaufort are labeled on the map.
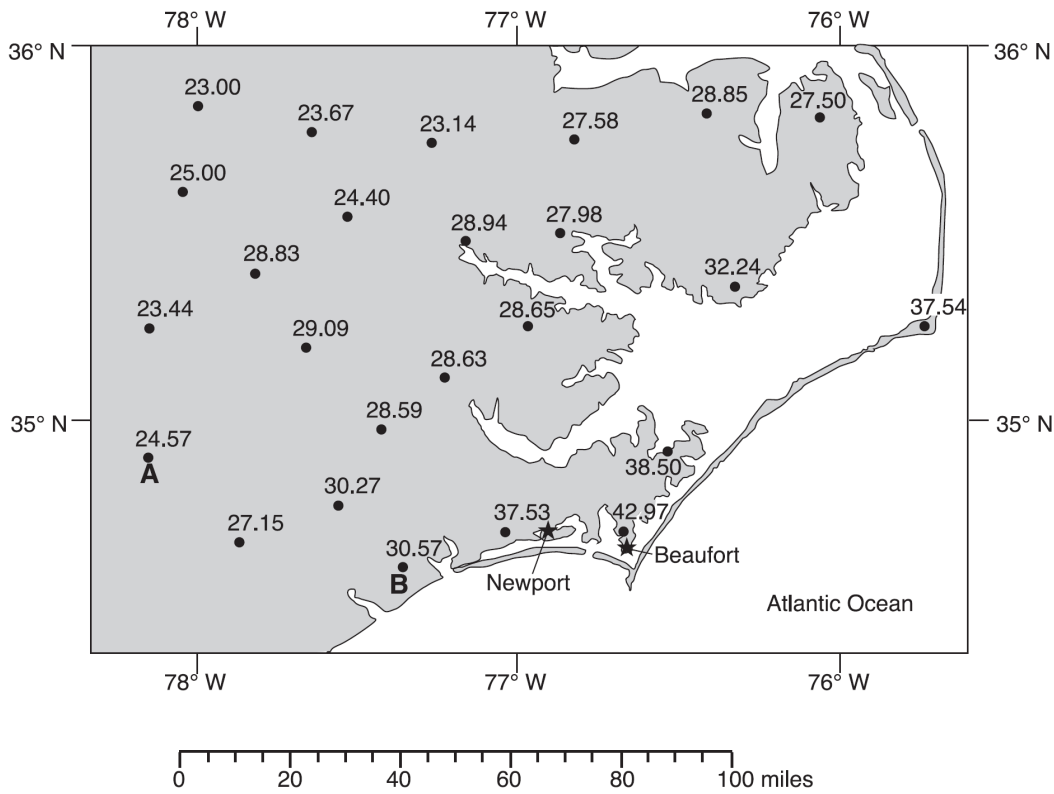
On the map above, use a smooth, curved line to draw the 25.00-inch precipitation isoline. The isoline must extend to the edges of the map.

Base your answers to questions **17** and **18** on the map below, which shows partially drawn contour lines. **X**s indicate elevations in meters. Letters *A, B, C,* and *D* represent locations on the map.

460
X

490
X

460
X

540
X

580
X

D

450
X

520
X

350
X

430
X

A

360
X

500

340
X

280
X

300
X

350
X

250
X

C

390
X

240
X

250
X

Blue Stream

250

450
X

310
X

150
X

B

290
X

420
X

250
X

180
X

400
X

510
X

200
X

350
X

470
X

300
X

540
X

360
X

250

Ocean

N

Contour interval = 50 meters

0   1   2   3   4   5   6   7   8 km
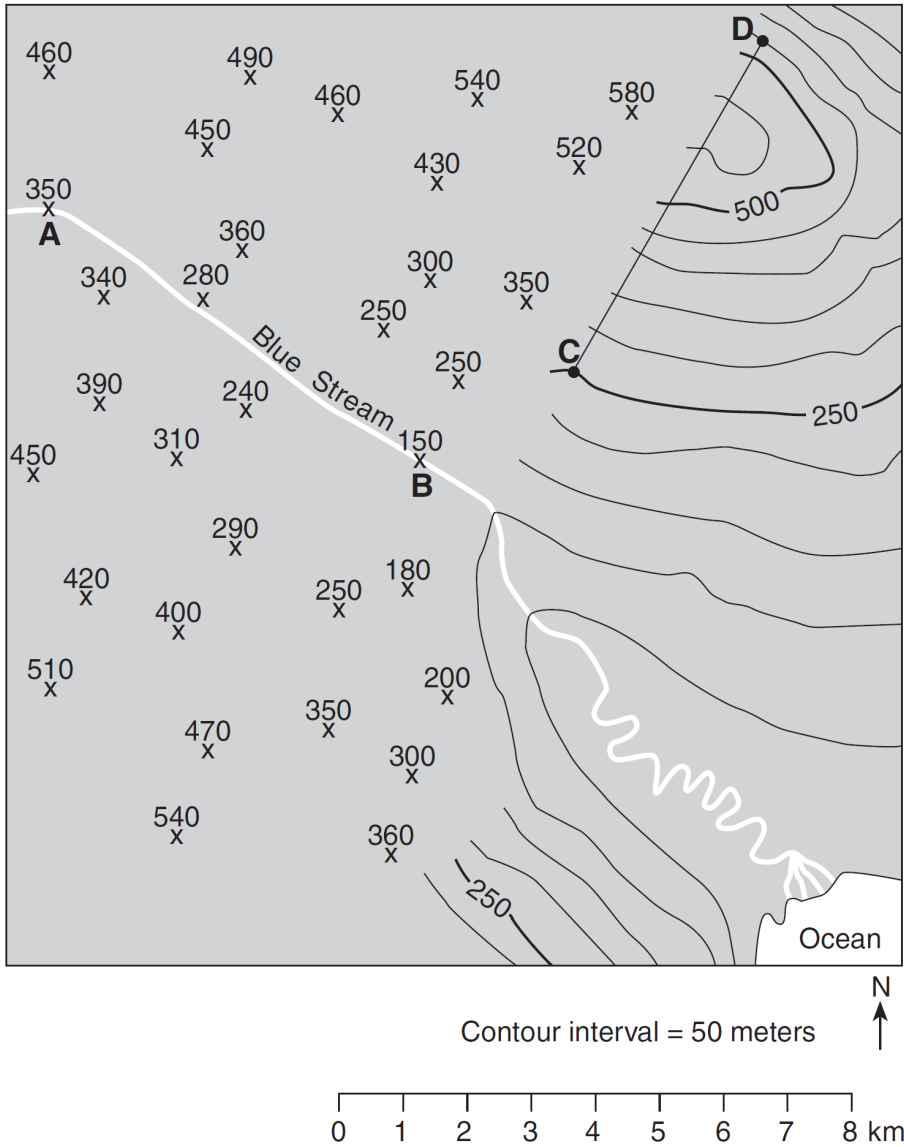
17. On the grid below, construct a topographic profile along line *CD*. Plot with an **X** the elevation of
    each contour line that crosses line *CD. Connect the Xs from C to D with a smooth, curved line to
    complete the profile. Elevations C and D have already been plotted.*
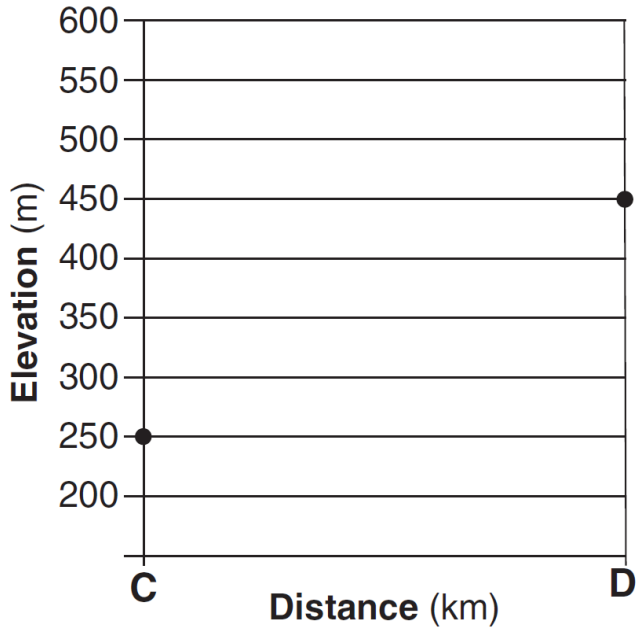
18. On the above complete the 250-meter contour line.

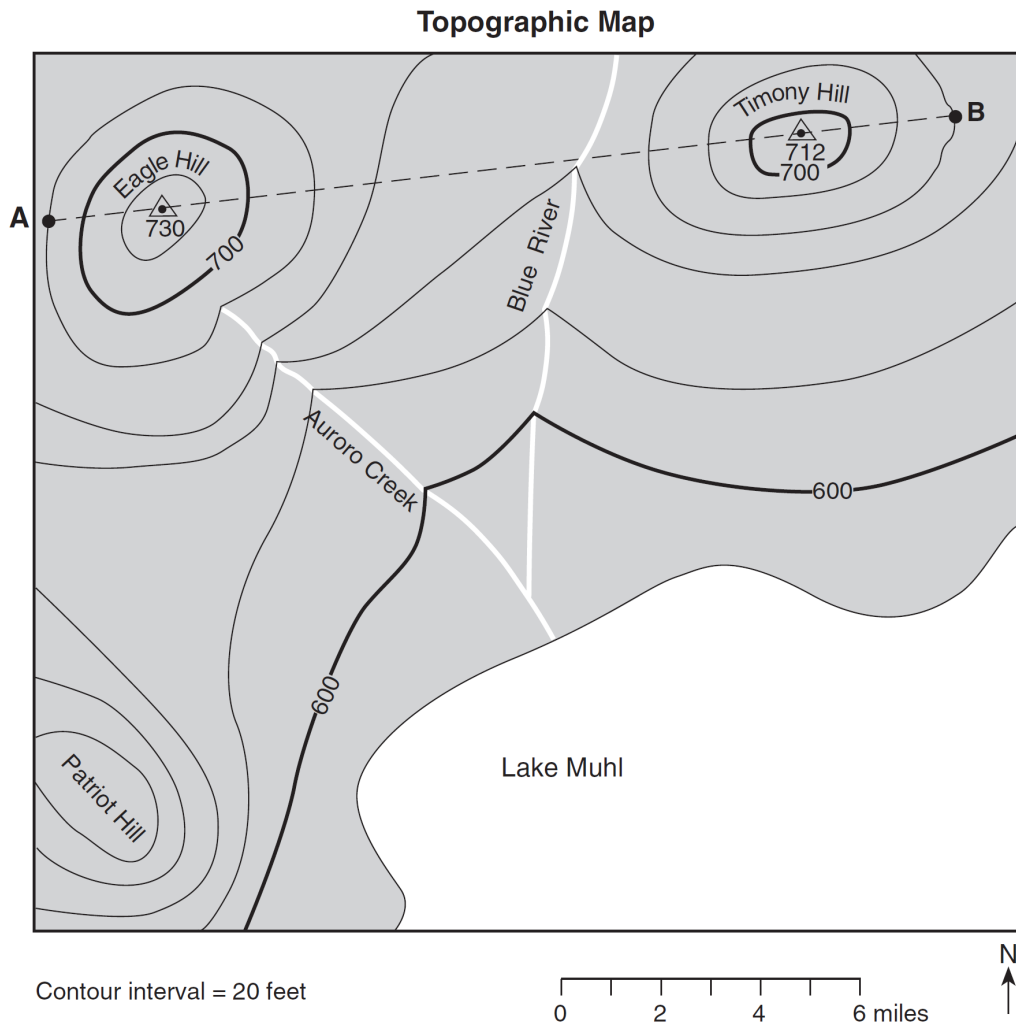19. Base your answer to the following question on the topographic map below. Points *A* and *B* are reference points on the map. The △ symbols show the highest elevations on Eagle Hill and Timony Hill. Elevations are shown in feet.

Topographic Map

Contour interval = 20 feet

On the grid below, construct a topographic profile along line *AB* by plotting an **X** for the elevation of each contour line that crosses line *AB*. Connect the plotted **X**s with a smooth, curved line to complete the profile. Points *A* and *B* have been plotted.

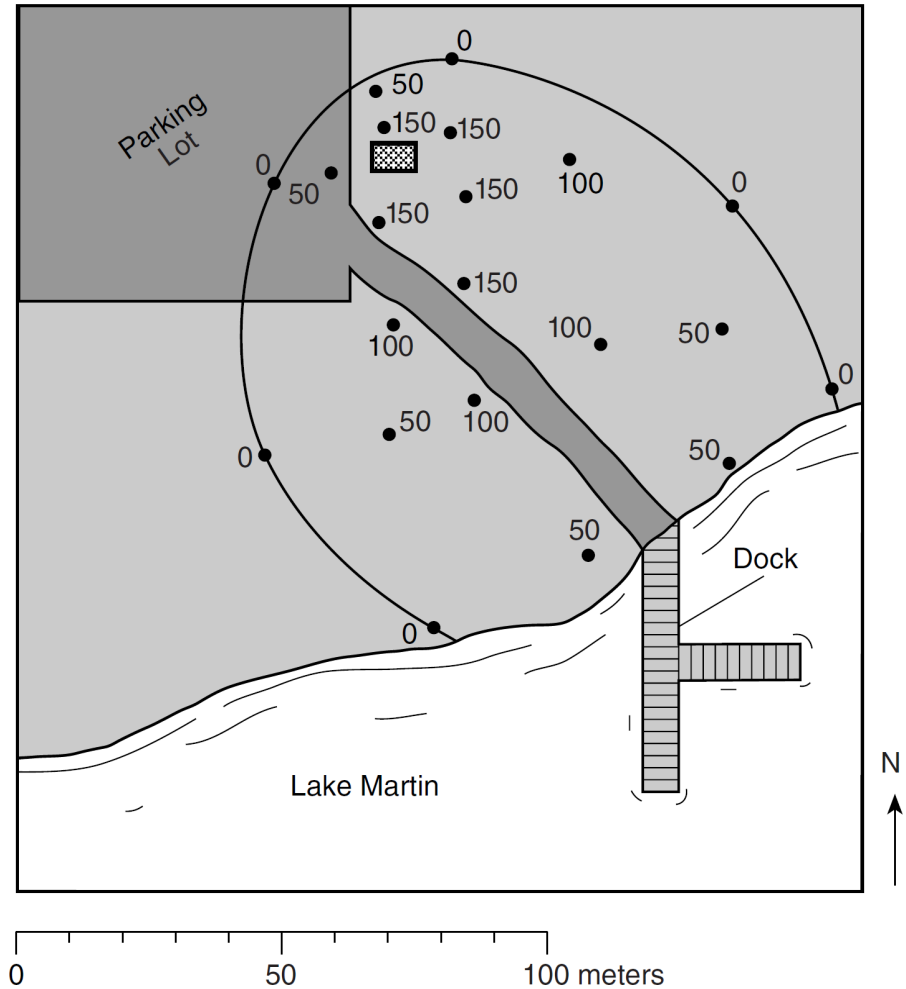Base your answers to questions **20** and **21** on the map in below. The map shows the water depth, measured in feet, at the north end of the Finger Lakes. Points *A* and *B* are locations at the lake's shoreline. Points *X* and *Y* are locations on the bottom of the lake.

Water Depths (feet)

20. 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.

21. On the map above, draw the 20 foot-depth isoline. The isoline must extend to the edge of the map.

22. Base your answer to the following question on the field map below, which shows an area of a state park where an underground gasoline tank leaked and contaminated the groundwater. Groundwater-monitoring wells were installed to determine the extent of the contamination. The concentration of contaminants in parts per million (ppm) in each of the wells is indicated on the map.
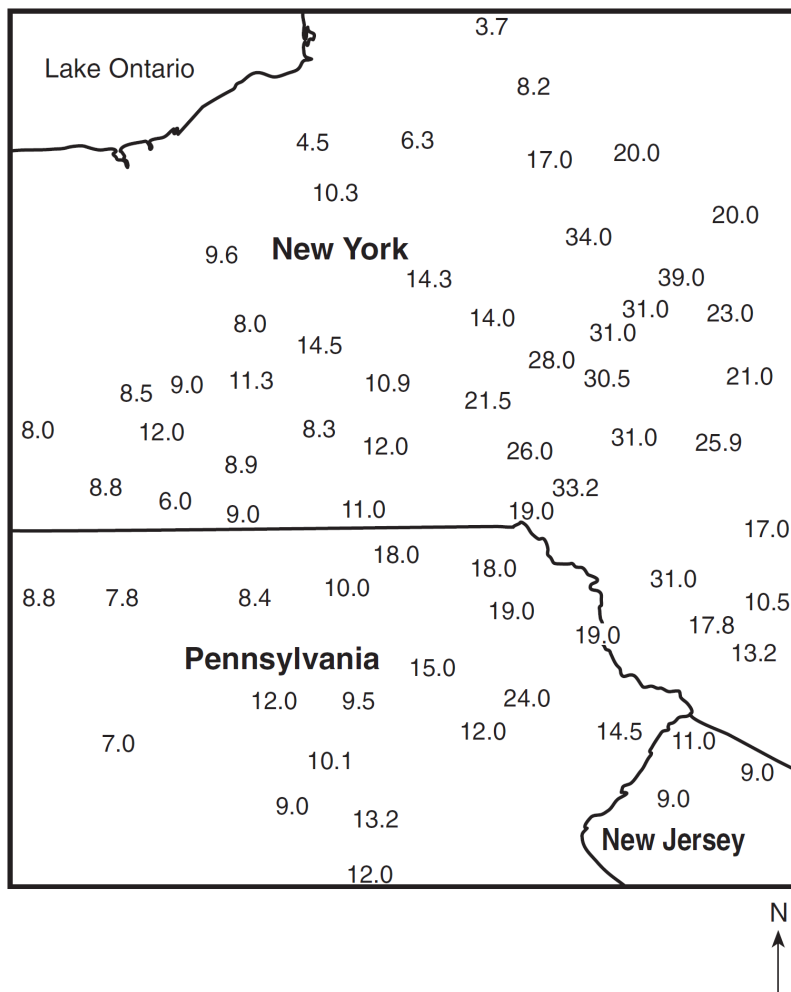
Area of State Park

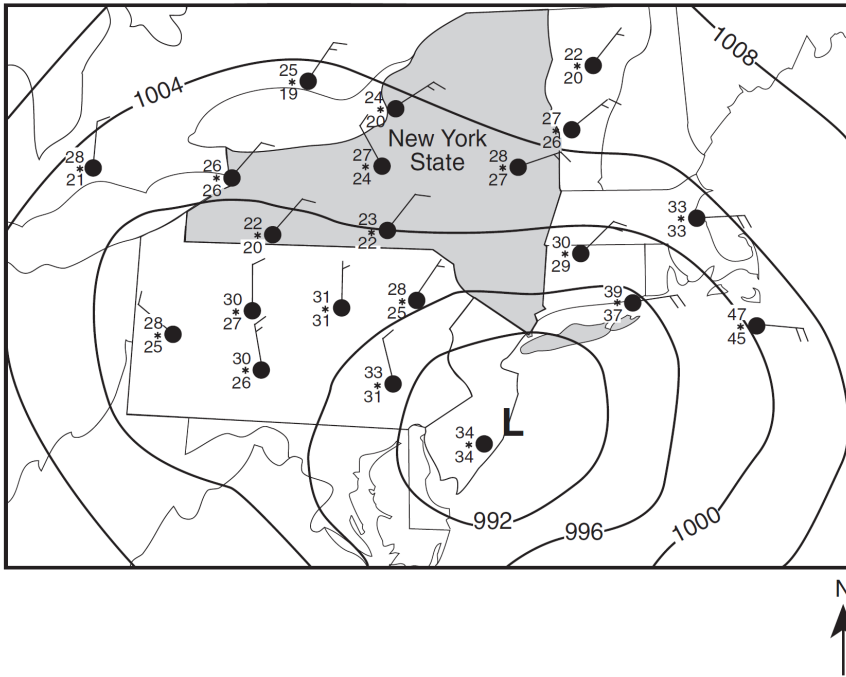On the field map above, draw the 50-ppm, 100-ppm, and 150-ppm isolines. The 0-ppm isoline has been drawn for you.

23. Base your answer to the following question on the two maps and on your knowledge of Earth science. Both maps show data from a December snowstorm. Map 1 shows the snowfall, measured in inches, at various locations in New York State, Pennsylvania, and New Jersey. Map 2 shows weather conditions in New York State and the surrounding region during the storm. Letter **L** represents the center of the low-pressure system that produced the snowstorm. Isobars show air pressure, in millibars.

Map 1
December Snowfall Amounts (inches)

Lake Ontario

3.7

8.2

4.5   6.3   17.0   20.0

10.3

20.0

34.0

9.6   **New York**

14.3   39.0

8.0   14.0   31.0   23.0

14.5   31.0

28.0

8.5 9.0 11.3   10.9   30.5   21.0

21.5

8.0   12.0   8.3   12.0   26.0   31.0   25.9

8.9

8.8   33.2

6.0   9.0   11.0   19.0

17.0

18.0

18.0   31.0

8.8   7.8   8.4   10.0   19.0   10.5

17.8

Pennsylvania   15.0   19.0   13.2

12.0   9.5   24.0

12.0   14.5   11.0

7.0   10.1   9.0

9.0   13.2   9.0

New Jersey

12.0

N

Map 2

| Weather Conditions	Description
present weather	
wind direction from	
wind speed (knots)	
relative humidity (%)	

Draw the 30.0-inch snowfall isoline on the map. Assume that the decimal point for each snowfall depth marks the exact location where the snowfall was measured.

24. Base your answer to the following question on the three western New York State snowfall maps below and on your knowledge of Earth science. The three maps represent three different winter seasons. The isolines show the total inches of snowfall received each winter season. Some western New York State counties are labeled on each map. The dotted line *AB* has been drawn on the 1991-1992 winter season map.

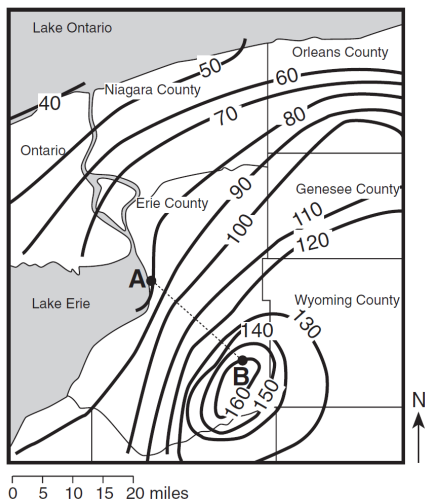**Total Inches of Snowfall Received**

1985–1986 Winter Season
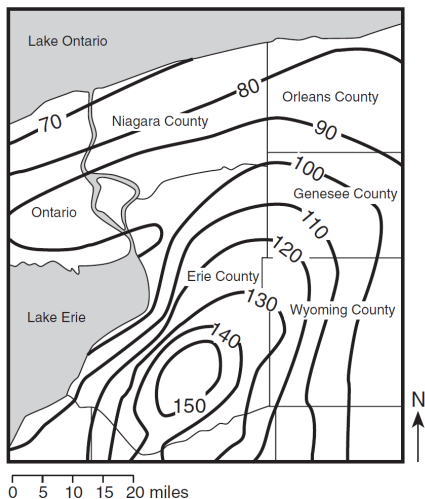
1990–1991 Winter Season
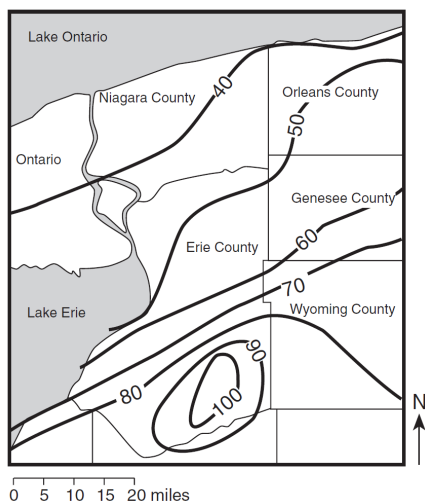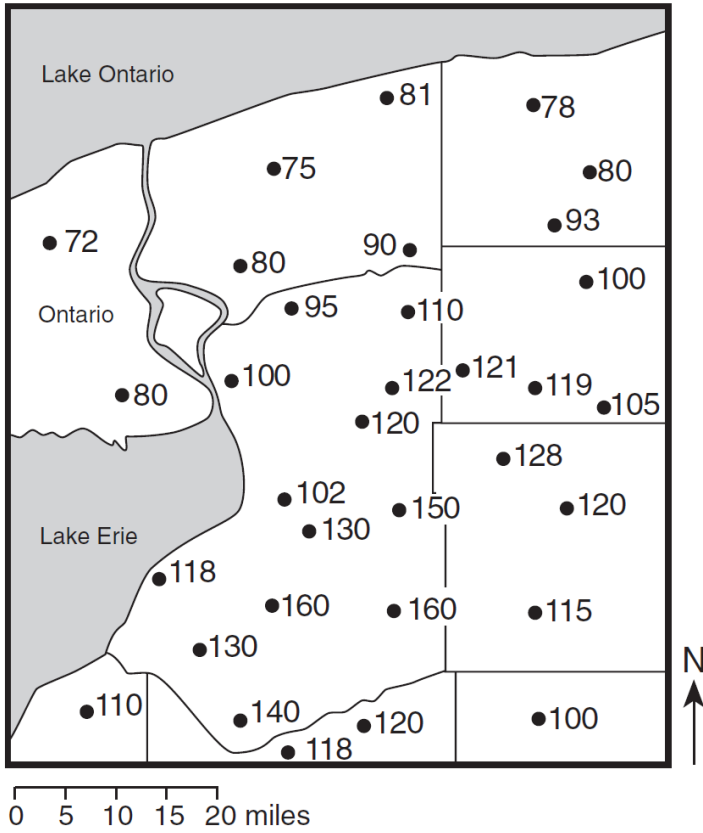

1991–1992 Winter Season

On the below that shows the total inches of snowfall received at various locations for the 1984-1985 winter season, draw the 120-inch snowfall isoline.

1984–1985 Winter Season

Lake Ontario

●81   ●78

●75   ●80

●93

● 72   90●   ●80

Ontario   ●80   ●95   ●110   ●100

●100   ●122 ●121 ●119

●80   ●120   ●105

●128

●102   ●150   ●120

Lake Erie   ●130

●118

●160   ●160   ●115

●130

N

●110   ●140   ●120   ●100

● 118

0   5   10   15   20 miles

25. Base your answer to the following question on the field map below. The map shows elevations, measured in feet, of a number of points in a certain geographic region. Contour lines have been drawn for the 100-foot and 120-foot elevations. Points *A* and *B* represent two spot elevations on the map.
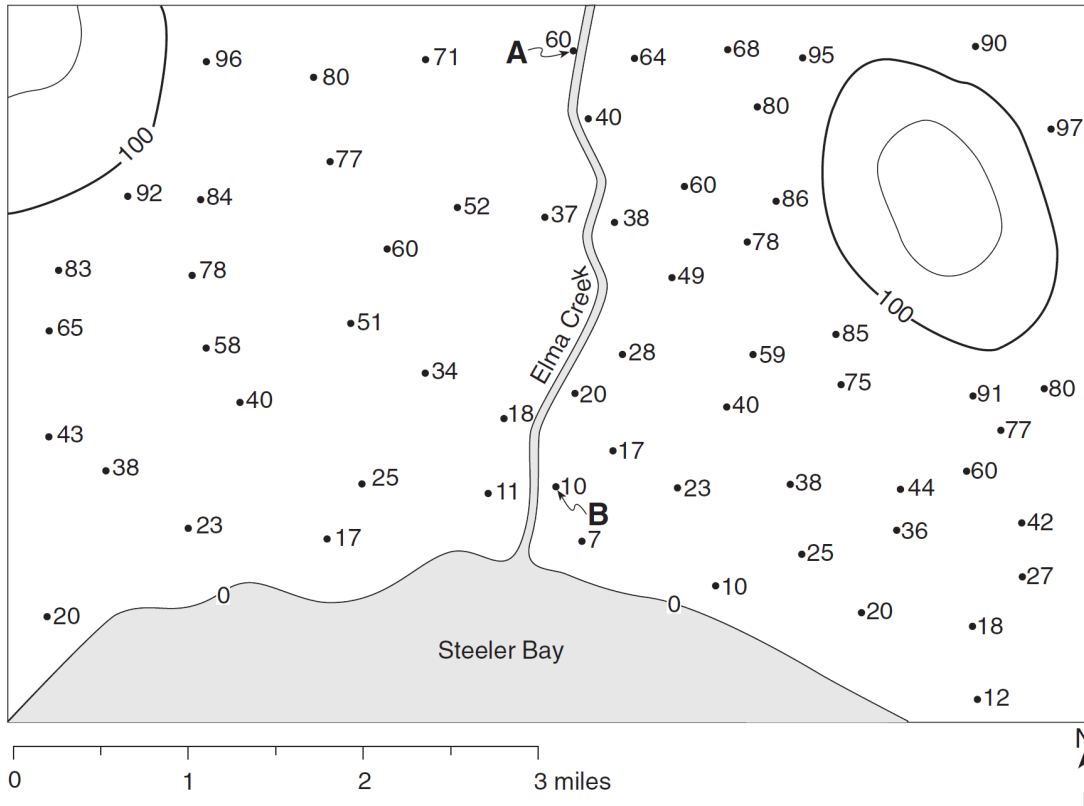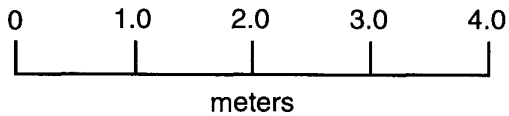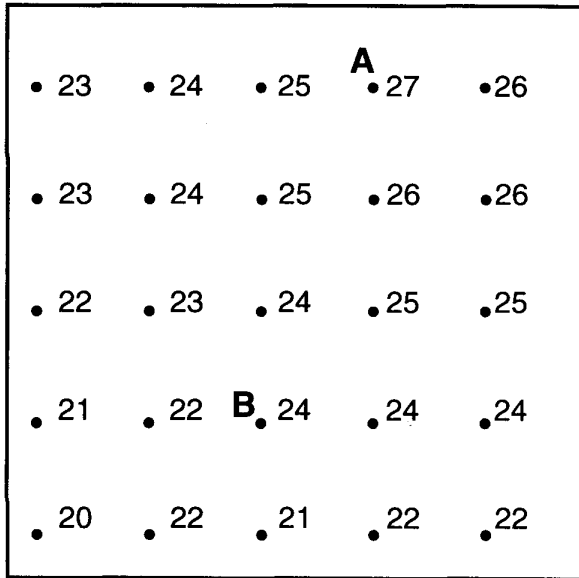

On the diagram above, draw the 60-foot contour line. Make sure that the contour line extends to the edges of the map.

26. Base your answer to the following question on the temperature field map below. the map shows 25
    measurements (in °C) 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.
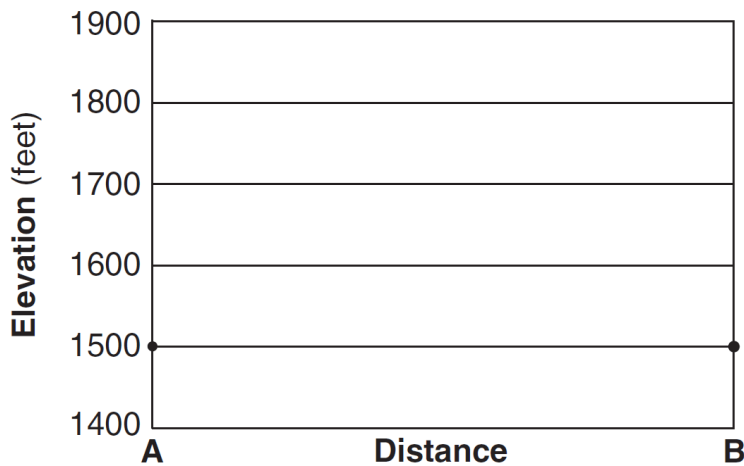
Temperature Field Map (°C)

			A	
• 23	• 24	• 25	• 27	•26
• 23	• 24	• 25	• 26	•26
• 22	• 23	• 24	• 25	•25
• 21	• 22	B• 24	• 24	•24
• 20	• 22	• 21	• 22	•22

0   1.0   2.0   3.0   4.0

meters

On the temperature field map above, draw threee isotherms: the 23°C isotherm, the 24°C isotherm,
and the 25°C isotherm.

27. Base your answer to the following question on the topographic map below and on your knowledge of Earth science. Lines *AB* and *CD* are reference lines on the map. Letter *E* indicates a location in a stream.

0   1   2   3 miles   Contour Interval = 100 feet
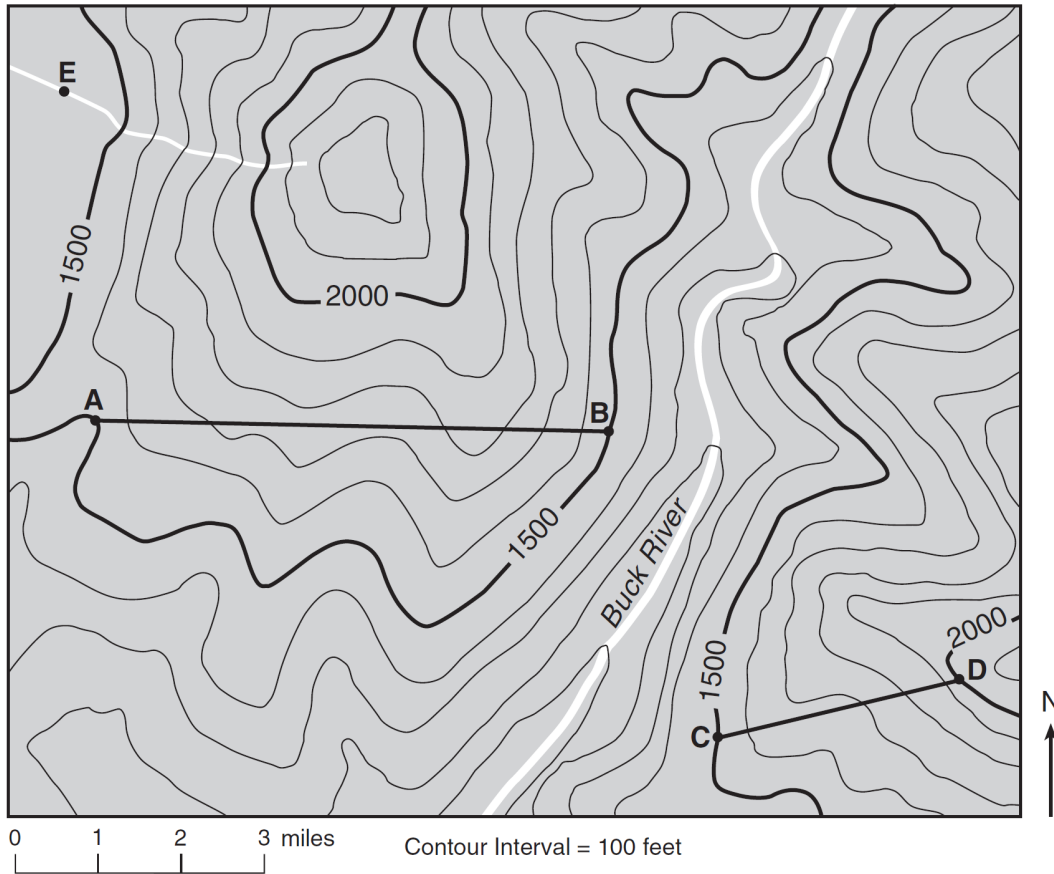
Using the grid, construct a topographic profile along line *AB* by plotting the elevation of each contour line that crosses line *AB*. Point *A* and *B* have already been plotted on the grid. Connect all plots with a line from *A* to *B* to complete the profile.

28. Base your answer to the following question on the temperature field map below. The map 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.

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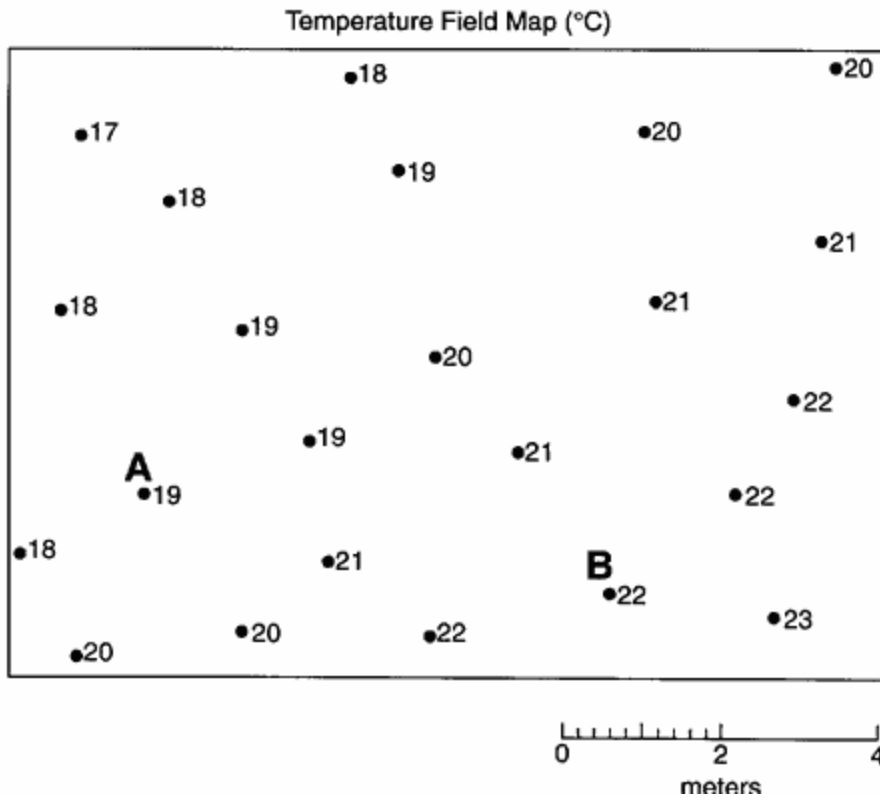
On the temperature field map, use solid lines to draw the 18°C, 20°C, and 22°C isotherms. Isotherms must extend to the boundary of the map. Label each isotherm to indicate its temperature.