The diagram below represents part of Earth’s latitude-longitude system.

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

(1) 5° E 30° N  
(2) 5° W 30° S  
(3) 5° N 30° E  
(4) 5° S 30° W
Base your answers to questions 58 through 61 on the contour map below. Letters A through H represent
locations in the area represented by the map. Contour lines are labeled in feet.

58 Calculate the gradient of the slope along the dashed line between points G and H on the map. Label the answer with the correct units.

50 (±3) feet per mile or ft/mi.

59 State how the shape of the contour lines crossing the Green River indicates that this river flows toward the southeast.

Contour lines that cross the Green River bend in the opposite direction of river flow.

Contour lines bend upstream when crossing the Green River.

Contour lines that cross the river form V-shapes. The point of each V-shape indicates the uphill or upstream direction.

60 Which letter represents the highest elevation? D.

61 Explain how the contour lines on the map indicate that the location labeled “Steep Cliff” is accurately named.

Contour lines are extremely close together.

The most closely spaced contour lines indicate the steepest gradient.
Base your answers to questions 51 and 52 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.

51. On the grid provided in your answer booklet, construct a topographic profile representing the cross-sectional view between point A and point B, following the directions below.
   a. 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.
   b. Connect the dots with a smooth, curved line to complete the topographic profile.

![Topographic profile diagram]

**ANSWER:**

52. What is the average gradient, in feet per mile, along the straight line from point C to point D? **25 ft/mi (±1).**
Base your answers to questions 36 through 38 on the topographic map below. Points X, Y, and Z are locations on the map. Elevations are expressed in meters.

36 Which profile best represents the topography along the dashed line from point X to point Y?

- (1) 200 m
- (2) 220 m
- (3) 240 m
- (4) 250 m

37 Mill River generally flows toward the

- (1) southeast
- (2) southwest
- (3) northeast
- (4) northwest

38 What is the elevation of point Z?

- (1) 190 m
- (2) 220 m
- (3) 240 m
- (4) 250 m
Calculate the gradient between points Y and Z on the map, and label the answer with the correct units.

Allow 1 credit for 6 or 6.0 (±0.3).

and

Allow 1 credit for feet/mile or ft/mi.
57 In the space provided in your answer booklet, determine the gradient of Squab Hollow Creek between point X and point Y by following the directions below.

a Using the Earth Science Reference Tables, write the equation used to determine the gradient.

b Substitute values into the equation.

c Solve the equation and label the answer with the correct units.

\[
g = \frac{600 \text{ m} - 500 \text{ m}}{5 \text{ km}}
\]

\[
g = \frac{100 \text{ m}}{5 \text{ km}}
\]

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

Contour lines bend upstream when crossing the creek.

The stream flows from higher elevations toward lower elevations.

59 Based on the latitude and longitude coordinates given, identify the New York State landscape region in which this map region is located.

Allegheny Plateau or Appalachian Plateau.
Mercado Dam is located 32 miles upstream from Lawson. In the remote possibility of a failure of the Mercado Dam, the Taterskill Creek is expected to rise to the 600-foot contour line in the vicinity of the two towns.
An island measures 10 kilometers from east to west and 8 kilometers from north to south. A single hill on the east side of the island has a maximum elevation of 57 meters and is steepest to the north. In the box provided in your answer booklet, draw a simple contour map to represent this island, using a distance scale of 1 centimeter = 1 kilometer and a contour interval of 10 meters.