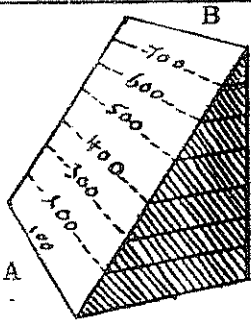
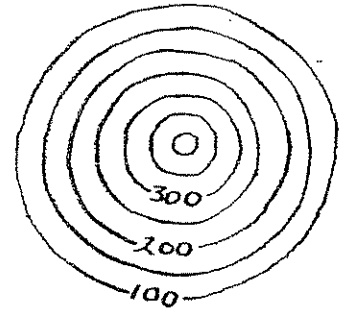
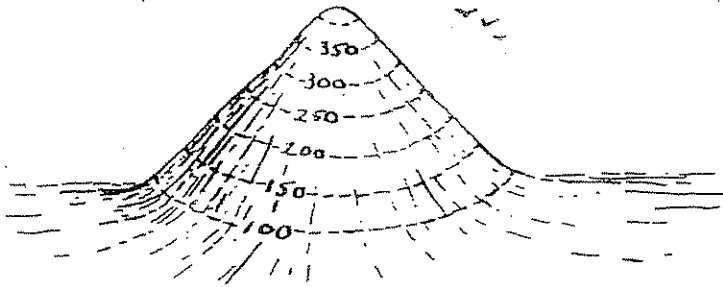


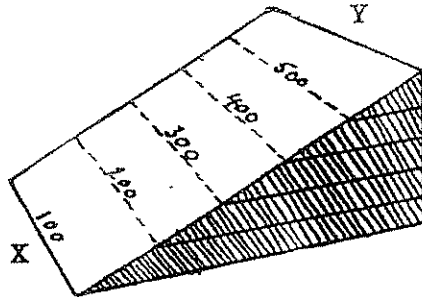
"MODEL"

CONTOUR MAP

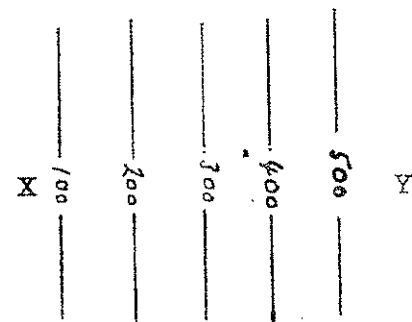
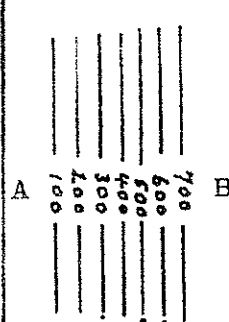
A conical hill:



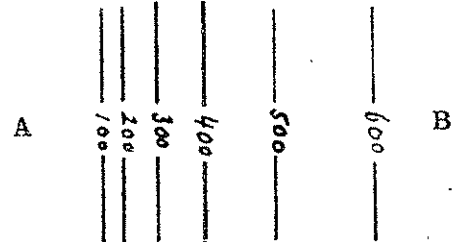
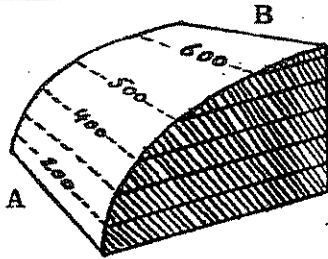
Steep slope



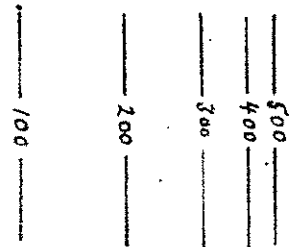
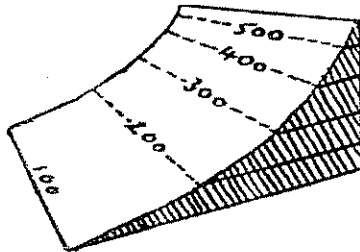
Gentle slope



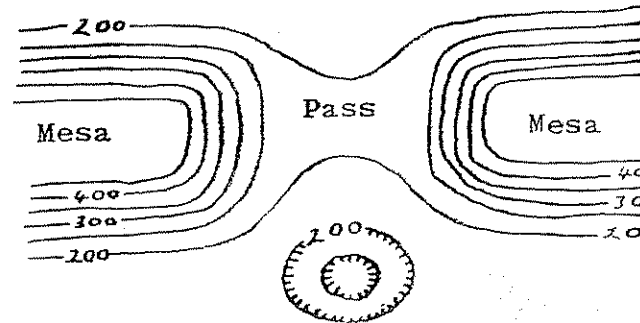
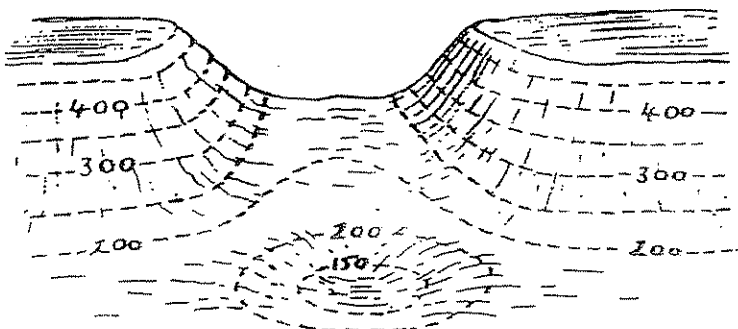
Convex slope



Concave slope



A pass through 2 hills, and a small depression or hollow:



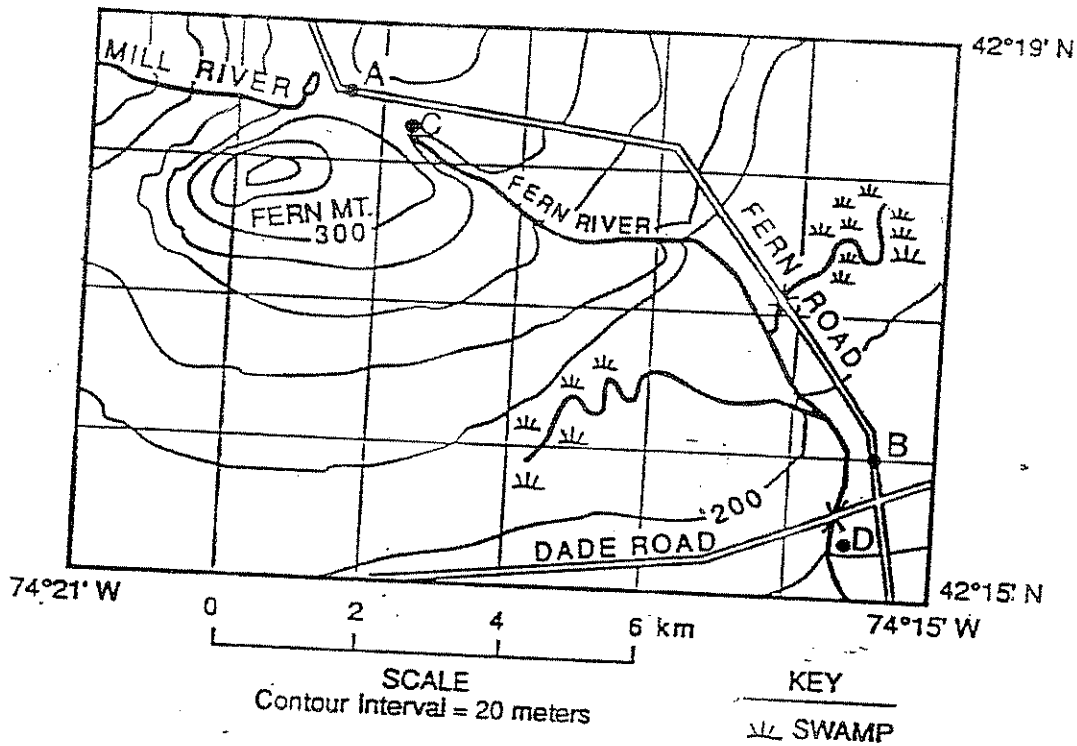
Part

This part consists of ten groups, each containing five questions. Choose seven of these ten groups. Be sure that you answer all five questions in each group chosen. Record the answers to these questions on the separate answer sheet in accordance with the directions on the front page of this booklet.

Group

If you choose this group, be sure to answer questions .

Base your answers to questions through on the topographic map below and your knowledge of Earth science. Points A through D represent locations in the region.



The top of Fern Mountain could have an elevation of

- (1) 301 m
- (2) 351 m
- (3) 362 m
- (4) 500 m

What is the approximate latitude of point B?

- (1) 74°22' W
- (2) 74°15' W
- (3) 42°16' N
- (4) 42°19' N

What is the approximate change in elevation from point C to point D?

- (1) 100 m
- (2) 280 m
- (3) 300 m
- (4) 500 m

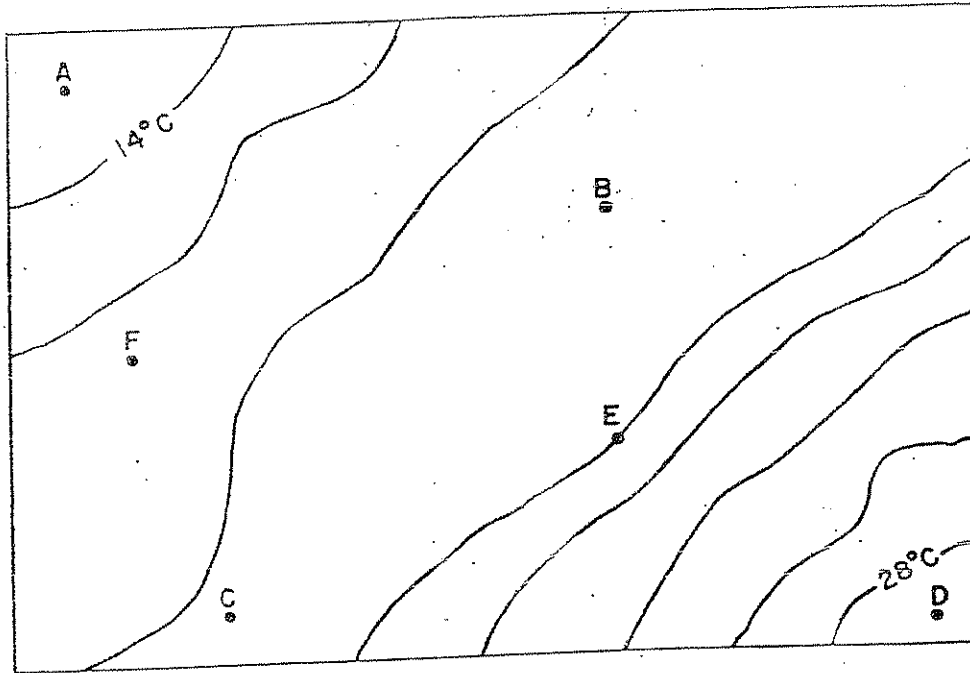
Compared to Mill River, Fern River appears to

- (1) flow in the opposite direction
- (2) have fewer tributaries
- (3) drain a smaller region
- (4) flow toward the same lake

What is the approximate distance between point A and point B measured along Fern Road?

- (1) 5.0 km
- (2) 8.0 km
- (3) 9.0 km
- (4) 10.0 km

Reference Tables, and the isoline map shown below. The map represents various temperatures taken 1 meter above the floor in a closed room. Letters A through F are various locations in the room also located 1 meter above the floor.



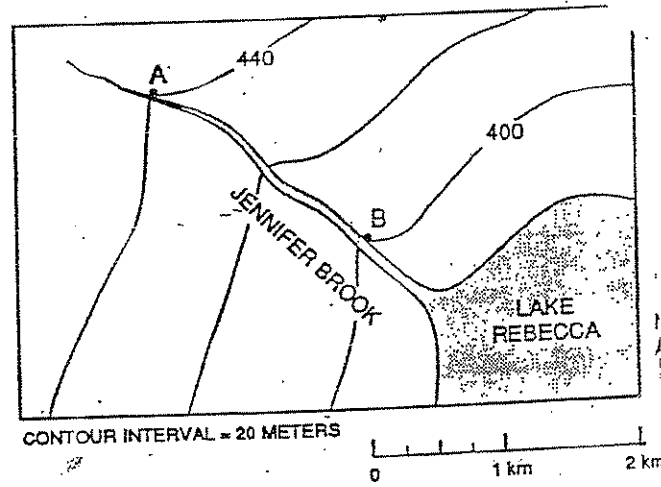
Name \_\_\_\_\_  
 Date \_\_\_\_\_  
 Period \_\_\_\_\_

- 1 The approximate temperature at location B is
- |          |          |
|----------|----------|
| (1) 24°C | (3) 19°C |
| (2) 22°C | (4) 17°C |

- 2 The smallest temperature gradient exists between locations
- |             |             |
|-------------|-------------|
| (1) A and B | (3) C and D |
| (2) B and C | (4) F and D |

- 3 A stream in New York State begins at a location 350 meters above sea level and flows into a swamp 225 meters above sea level. The length of the stream is 25 kilometers. What is the gradient of the stream?
- |            |             |
|------------|-------------|
| (1) 5 m/km | (3) 12 m/km |
| (2) 9 m/km | (4) 17 m/km |

Base your answers to questions 4 and 5 on the map below.

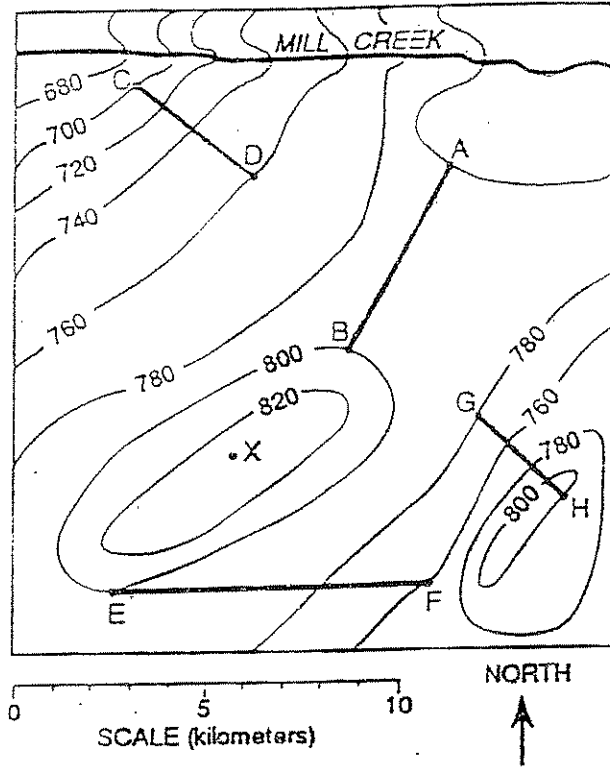


- 4 In which direction does Jennifer Brook flow?
- |             |             |
|-------------|-------------|
| 1 southwest | 3 southeast |
| 2 northwest | 4 northeast |
- 5 What is the approximate gradient, in meters per kilometer, of Jennifer Brook between points A and B?
- |             |              |
|-------------|--------------|
| (1) 20 m/km | (3) 80 m/km  |
| (2) 40 m/km | (4) 220 m/km |

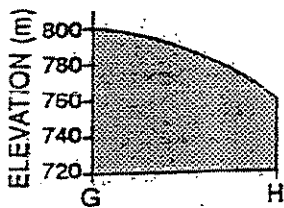
NAME \_\_\_\_\_

Top. Maps with Profiles

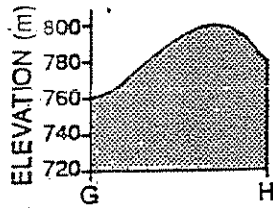
Base your answers to questions through on the *Earth Science Reference Tables*, the topographic map below, and your knowledge of earth science. The topographic map represents elevation contours measured in meters. Four straight lines, AB, CD, EF, and GH, have been drawn for reference purposes.



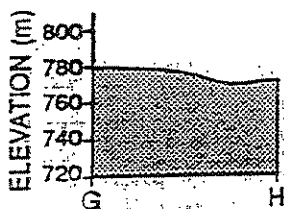
1. What could be the elevation of point X?  
 (1) 819 m                      (3) 841 m  
 (2) 826 m                      (4) 850 m
2. Which profile below most likely represents cross section GH?



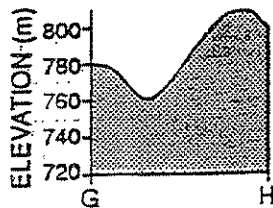
(1)



(3)



(2)



(4)

3. What is the general direction of flow of Mill Creek?  
 1 east to west                      3 north to south  
 2 west to east                      4 south to north
4. Between which two locations is the gradient approximately 15 meters per kilometer?  
 (1) A and B                      (3) C and D  
 (2) E and F                      (4) G and H

Note that question 5 has only three choices.

5. If uplifting and leveling forces are in a state of dynamic equilibrium, the average elevation of the area will  
 1 decrease  
 2 increase  
 3 remain the same

ANSWERS: 1

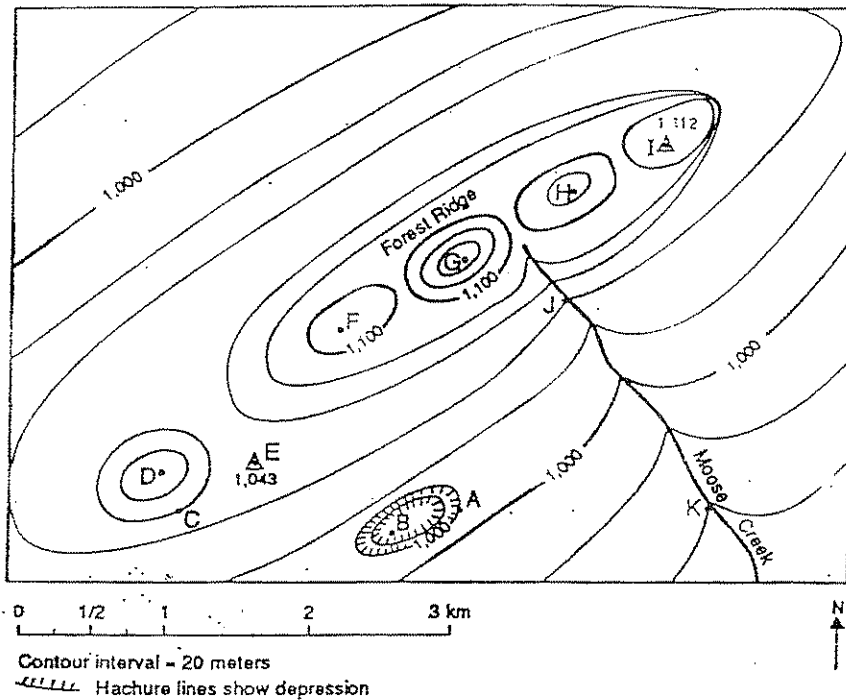
2

2

4

5

Use your answers to questions 1 through 8 on the Earth Science Reference Tables, the contour map below, and your knowledge of Earth science. Letters A through K represent locations in the area. Hachure lines (like ||||) show depressions.



3 Which hilltop could have an elevation of 1,145 meters?

- (1) D                      (3) G  
 (2) F                      (4) H

Toward which direction does Moose Creek flow?

- 1 southeast              3 southwest  
 2 northeast             4 northwest

Which equation would be used to determine the stream gradient along Moose Creek between points J and K?

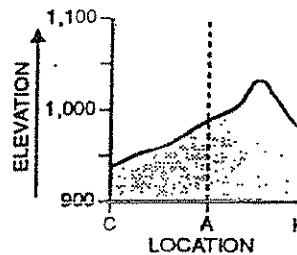
$$\text{gradient} = \frac{1.8 \text{ km}}{80 \text{ m}} \times 100$$

$$\text{gradient} = \frac{0.8 \text{ km}}{60 \text{ m}}$$

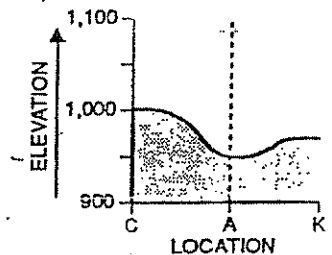
$$\text{gradient} = (1,040 \text{ m} - 960 \text{ m}) \times 20 \text{ m}$$

$$\text{gradient} = \frac{80 \text{ m}}{1.8 \text{ km}}$$

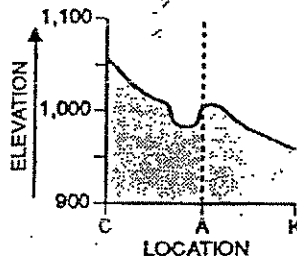
9 Which graph best represents the map profile along a straight line from point C through point A to point K?



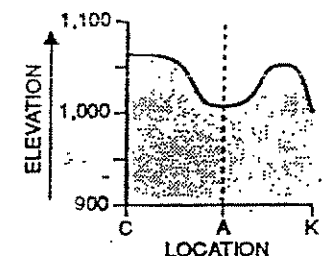
(1)



(3)



(2)



(4)

10 What is the lowest possible elevation of point B?

- (1) 981 m                      (3) 961 m  
 (2) 971 m                      (4) 941 m

## TOPOGRAPHIC MAPS

Use the diagram to the right to answer questions 1 through 6.

1. What general direction does Mill River flow? Give one way you can tell.

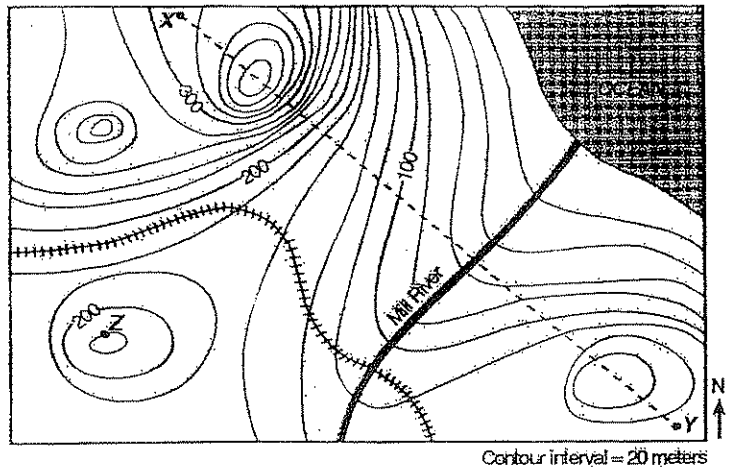
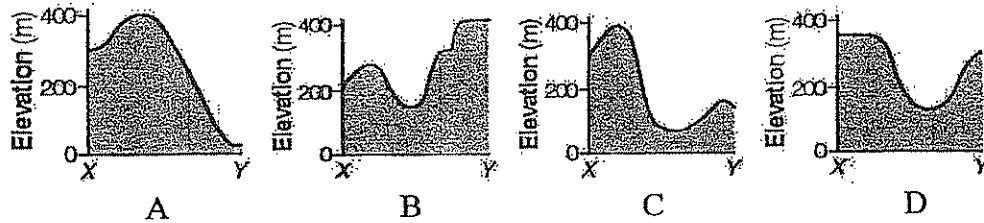
2. What is the contour interval of this map?

3. Which part of the map has the highest elevation?

4. What is the elevation of Point Z?

5. What is the highest possible elevation for the top of the hill near Point X?

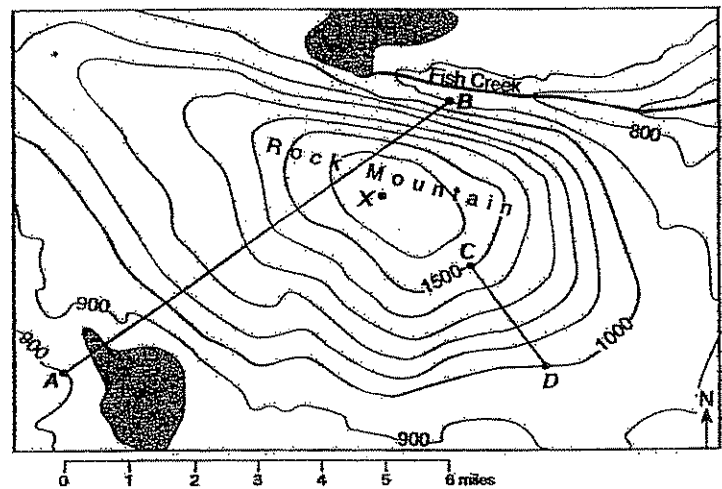
6. Which of the profiles below could represent the line from Point X to Point Y?



7. Which lettered location is found near the steepest slope? How do you know?

8. What is the contour interval of this map?

9. What is the straight line distance (in miles) from Point D to the beginning of Fish Creek?



10. In the space below, sketch how you think the general shape of the profile would look from Point A to Point B.

## STREAMS

The head of a stream is the place where it starts. The place where it ends, in a lake or ocean, is called the mouth. Look at the figure below for the following questions.

13. What letter is at

a) the head of the stream? \_\_\_\_\_

b) the mouth of the stream? \_\_\_\_\_

14. Where contour lines "cross" a stream, they \_\_\_\_\_

15. a) Everyone knows that water flows \_\_\_\_\_ (uphill, downhill)

b) In other words, water flow from a \_\_\_\_\_ (higher, lower) elevation to a \_\_\_\_\_ (higher, lower) elevation.

16. At a stream, contour lines seem to form "arrows." Each "arrow" points...

a) toward the \_\_\_\_\_ (head, mouth) of the stream.

b) \_\_\_\_\_ (upstream, downstream)

c) \_\_\_\_\_ (toward, away from) the direction of flow.

