

Part 3 Rivers and lakes on a map

This section deals with how rivers and lakes appear on topographic maps.

Use the photocopy of a map section to answer the questions. This map comes from the topographic map of Glacier National Park, Montana. A copy of the original map may be in the room that you can look at if you have trouble finding features on the photocopy.

The North Fork Flathead River is the main river on this map. It is in the center of the map. To help you locate places more quickly on the map, the locations listed in questions 1-12 are highlighted in yellow.

1A. What direction does the North Fork Flathead River flow?

1B. Give one bit of evidence supporting the answer you gave in question 1A.

2A.. How many vertical feet does Logging Creek drop from Logging Lake to the Logging Creek Ranger Station?

2B. What is the average drop of this section of Logging Creek in feet per mile?

3. What is the name of the river feature just upstream the North Fork Flathead River from the Logging Creek Ranger Station?

4. Does the North Fork Flathead River show any evidence of flooding near the stretch near Home Ranch Bottoms? Provide an explanation for your answer.

5. Which area has the faster rate of runoff -- south of Glacier View Mountain or west of Anaconda Hill? Explain how you determined this.

6A. Northeast of Grace Lake you should see the word "divide." This is a continental divide. How is a divide important to rivers?

6B. What would happen to the amount of rainfall you would expect if you crossed the divide going to the east one or two map widths?

7. How would you describe the relationship of Cummings Creek to Quartz Creek?

8A. What is the source of water for Grace Lake? You may want to look at the big map to answer this question.

8B. Estimate the water temperature on 1 May at the bottom of Grace Lake.

8C. What water quality problem might you expect in Grace Lake?

9A. At BR 3364 (east of Glacier View Mountain), which side of the river -- east or west -- is probably moving more quickly? Explain your reasoning.

9B. At BR 3364, the river abruptly changes direction. Offer a possible explanation for why the river turns instead of going straight.

10. If you were at the north end of Grace lake with a view of the surrounding area (not blocked by trees) would you see a waterfall? Explain your answer.

11A. Assume the surface of Cyclone Lake is a circle. What is the diameter (in kilometers) of the lake using for a diameter a west-to-east line from the stream coming into the lake from almost due west to the outflow on the east side? At your table is another portion of the original map that you may need to use.

11B. Southwest of Cyclone Lake is a “square” formed by a dotted line and with a “21” in the middle of it. Imagine that 3.00 cm of rain falls uniformly over the square. What volume in m^3 of rain fell? If needed, use the conversion for the map that meters = feet x 0.3048. (The dotted lines actually form a “section” of a township, and these sections are based upon a common measurement.)

11C. The landform in square 21 has a texture such that 70% of the falling rain becomes runoff. If the runoff from the square as described in 12B flows into Cyclone Lake and we assume that Cyclone Lake is temporarily dammed up so that no water leaves, what is the minimum number of cm that Cyclone Lake should go up? Remember, this is an unusual rain event. Rain did not fall over the lake or any of the squares besides 21 and all the water in 21 that runs off will drain towards Cyclone Lake.

12. Offer a brief explanation for the formation of Logging Lake.