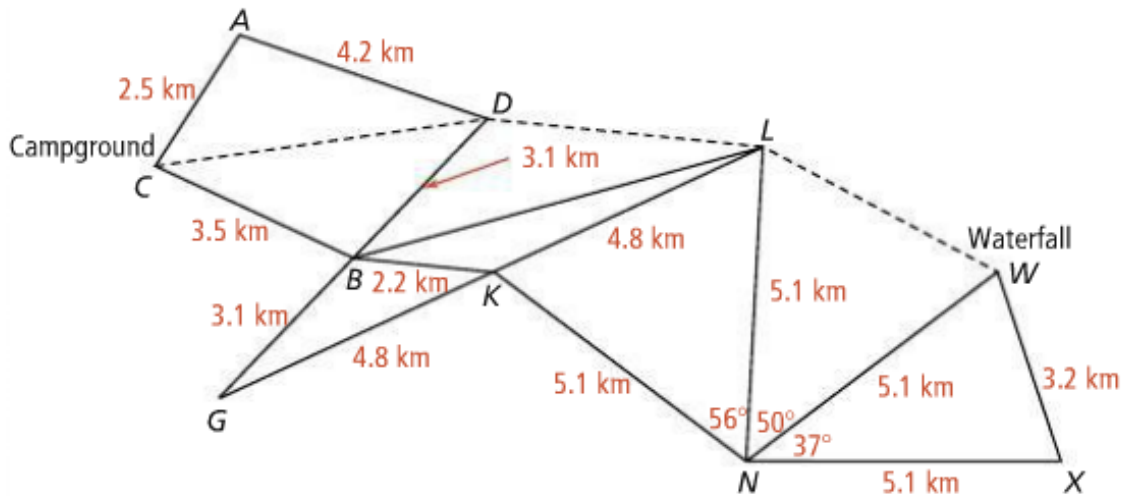


Unit 5: Relationships Within Triangles Project

Estimating the Length of a Hiking Trail

Several hikers plan to hike along some trails from their campground to a waterfall. The trail map below shows their hike with a dashed line. Unfortunately, the lengths of some of the trails are missing on this map. The hikers would like to find a range of values for the total length of their hike.



Task: Find the range, in kilometers, for the length of the group’s hike from the campground to the waterfall.

Part 1: Apply What You’ve Learned

Select all of the following that are true. Explain your reasoning.

- A. In $\triangle DGL$, \overline{BL} is a midsegment.
- B. In $\triangle DGL$, \overline{BK} is a midsegment.
- C. \overline{BK} is parallel to \overline{DL} .
- D. \overline{BL} is parallel to \overline{GK} .
- E. The length of \overline{BK} is half the length of \overline{BL} .
- F. The length of \overline{DL} is twice the length of \overline{BK} .

G. \overline{DL} is the shortest side of $\triangle DGL$.

Part 2: Apply What You've Learned

Consider $\triangle CAD$ and $\triangle CBD$.

A. Using the given side lengths in $\triangle CAD$, what can you conclude about the range of the possible lengths of \overline{CD} ? Explain.

B. One of the hikers states that \overline{CD} could be 6.6 km long. Do you agree or disagree? Give an argument to justify your response.

C. Using the Triangle Inequality Theorem on $\triangle CAD$ and $\triangle CBD$, determine the range of possible lengths of \overline{CD} .

Part 3: Apply What You've Learned

Now you will consider the last segment of the hike.

A. Write an inequality that shows an upper bound for the length of \overline{LW} . Explain your reasoning.

B. Write an inequality that shows a lower bound for the length of \overline{LW} . Explain your reasoning.

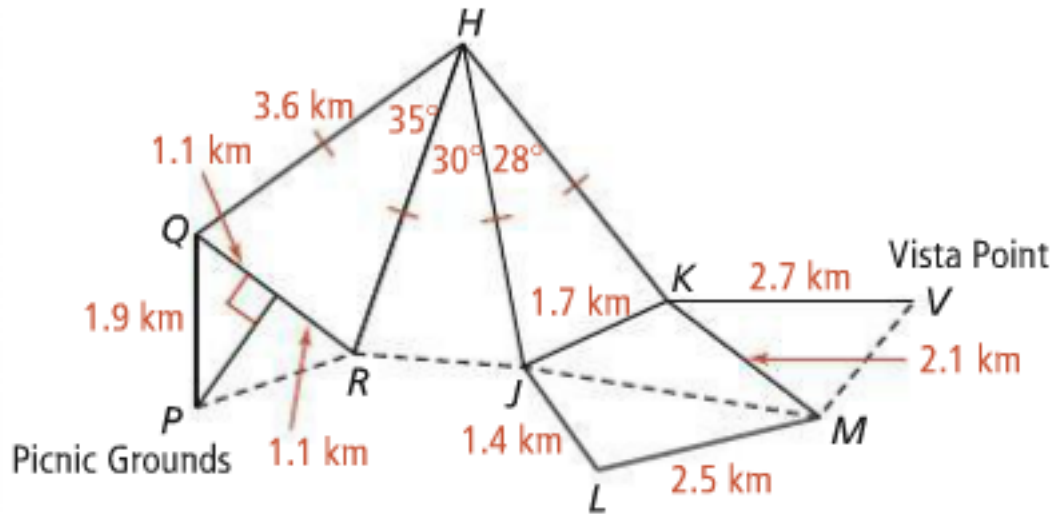
C. Use your answers from Parts A and B to write a compound inequality that shows the range of possible lengths of \overline{LW} .

Part 4: Completing the Performance Task

Solve the problem in the Task by finding a range, in kilometers, for the length of the group's hike from the campground to the waterfall. Show all your work and explain each step of your solution.

Part 5: On Your Own

The hikers are planning their next hike, from the picnic grounds to the vista point in the map below. Once again, the hike is shown with a dashed line and some of the trail lengths are missing on the map.



Find a range, in kilometers, for the length of the group's hike from the picnic grounds to the vista point.