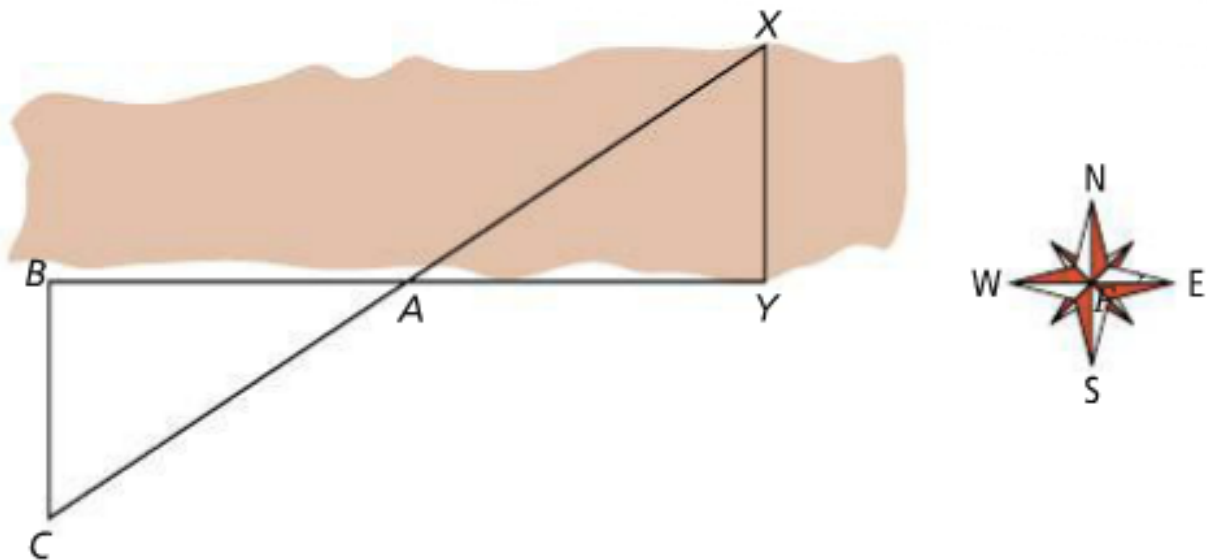


Name: _____ Date: _____ Band: _____
Geometry

Unit 4: Congruent Triangles Project

Estimating the Distance Across a Gorge

Jamal wants to estimate the distance across a gorge shown in the diagram below. He stands at point Y and locates the tree at point X directly across the gorge to the north. He then walks west along the gorge 500 ft and marks point A. After walking another 500 ft in the same direction, he turns 90° and walks south, perpendicular to the gorge. He stops when his location appears to form a straight line with points A and X. Jamal measures the distance BC as 327 ft.



Task: Estimate the distance XY across the gorge.

Part 1: Apply What You've Learned

- Label the diagram. Include all the given information in your diagram.
- Which angles do you know to be congruent? Explain.
- Which sides do you know to be congruent? Explain.

D. Can you conclude that $\triangle ABC \cong \triangle AYX$ using the definition of congruent triangles? If not, what additional information would you need?

Part 2: Apply What You've Learned

A. Look at the diagram you labeled. Which congruent postulate or theorem can you use to prove the two triangles are congruent?

B. Write a proof that the two triangles are congruent using only the information that you already have.

Part 3: Apply What You've Learned

Choose from the following words and names of figures to complete the sentences below.

| | | | |
|-----------------|-----------------|-----------------|-----------------|
| congruent | corresponding | \overline{AY} | \overline{AC} |
| $\angle Y$ | $\angle YAX$ | $\angle X$ | $\angle C$ |
| $\triangle AYX$ | $\triangle YAX$ | \overline{BC} | \overline{YX} |

In Part 2, you proved that $\triangle BAC \cong$ a. _____.

Now, you can conclude that $\angle C \cong$ b. _____ because c. _____ parts
of d. _____ triangles are congruent.

Similarly, e. _____ and \overline{AX} are congruent corresponding sides. Another pair of
congruent corresponding sides are f. _____ and \overline{YX} .

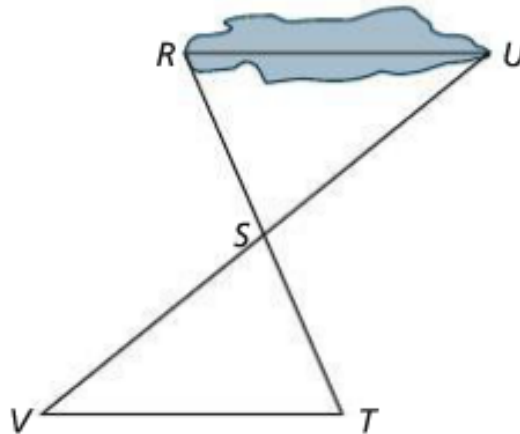
Part 4: Completing the Performance Task

Solve the problem in the Task by estimating the distance XY across the gorge. Show all your work and explain each step of your solution.

Part 5: On Your Own

Caitlin wants to estimate the distance across a pond. She begins at one end of the pond, shown as point R in the diagram below. She turns away from the pond, walks 300 ft in a straight line, and marks point S . She walks another 300 ft in the same direction and marks point T .

Next, Caitlin goes over to point U at the other end of the pond. She then measures the distance as she walks on a straight line to point S and finds that this distance is 340 ft. She continues another 340 ft in the same direction and marks point V .



A. Label the diagram with the given information.

B. What additional measurement should Caitlin determine to estimate the distance RU across the pond? Justify your answer.