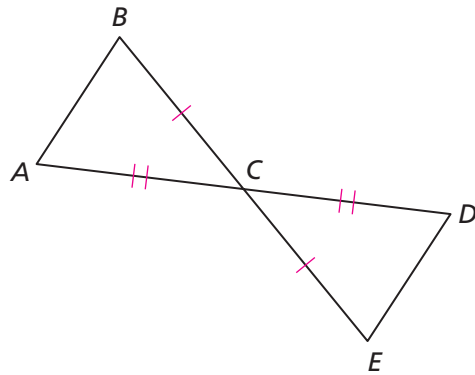


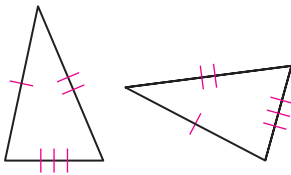
Applications

1. Determine whether $\triangle ABC$ and $\triangle DEC$ are congruent. Explain. Assume points B , C , and E are on the same line, as are points A , C , and D .

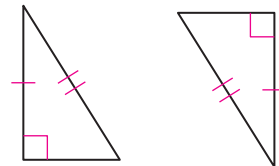


Decide whether you can tell for certain that the triangles in each are congruent based *only* on the given information.

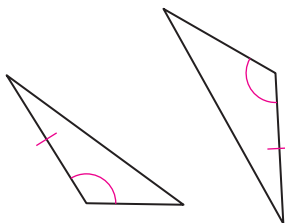
2.



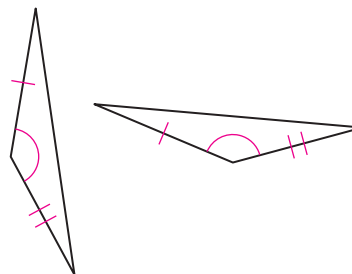
3.



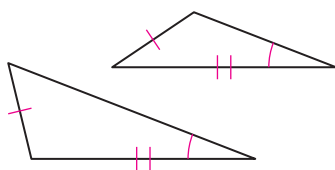
4.



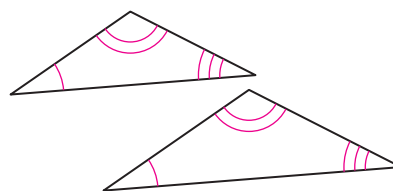
5.



6.



7.

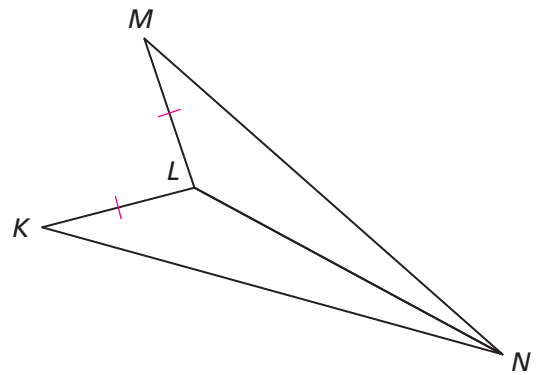


Go Online
PHSchool.com

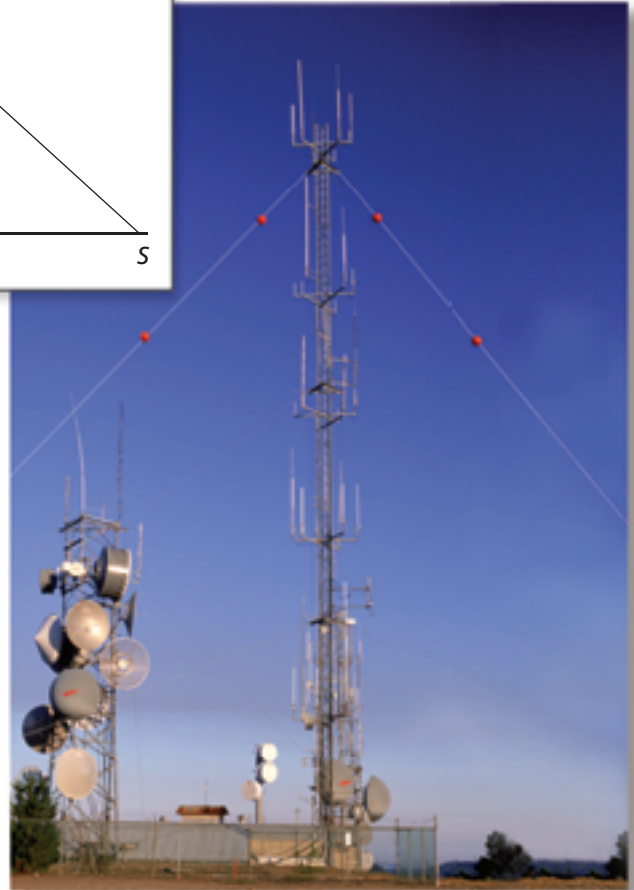
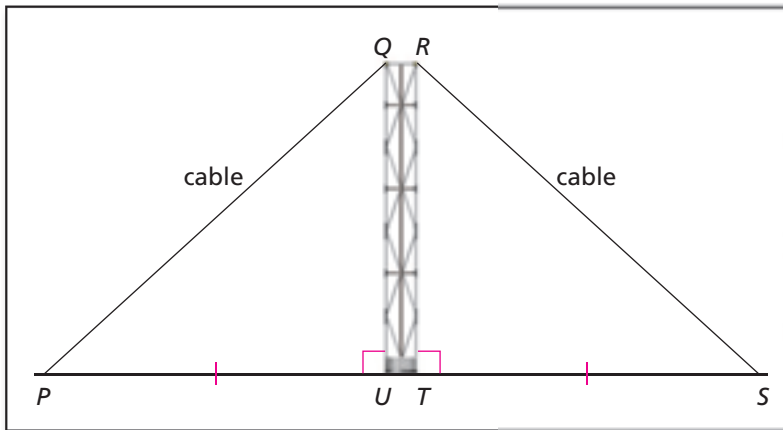
For: Multiple-Choice Skills
Practice

Web Code: apa-5454

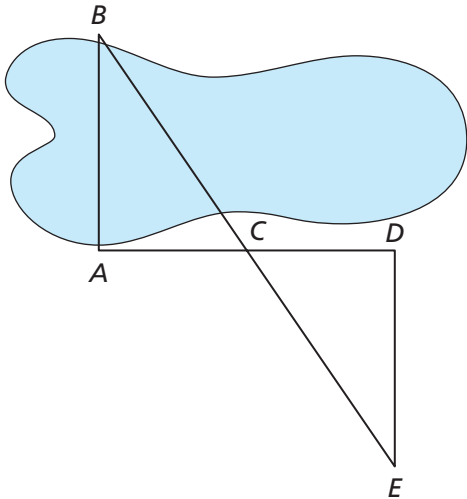
8. Suppose you want to prove that $\triangle KLN$ and $\triangle MLN$ are congruent. The diagram shows only $\overline{ML} = \overline{KL}$. What additional information do you need to show that the triangles are congruent because



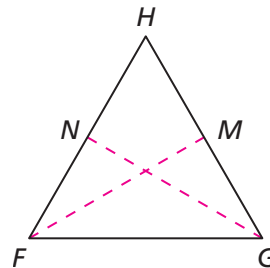
- three pairs of corresponding sides are congruent?
 - two sides and the included angle of one triangle are congruent to two sides and the included angle of the other?
 - two angles and the common side of one triangle are congruent to two angles and the common side of the other?
9. In the diagram below, two cables extend in opposite directions from the top of a tower to the ground. Use what you know about congruent triangles to determine whether the cables are the same length.



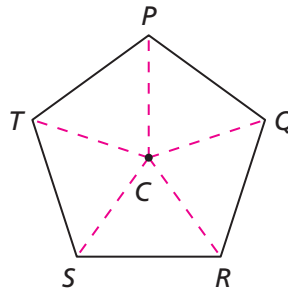
10. Alejandro wants to measure the distance directly across a pond from A to B . He uses string and some stakes to create the setup shown in the diagram below. None of his string can cross the pond. What information does Alejandro need to build into his setup to find the length of \overline{AB} ?



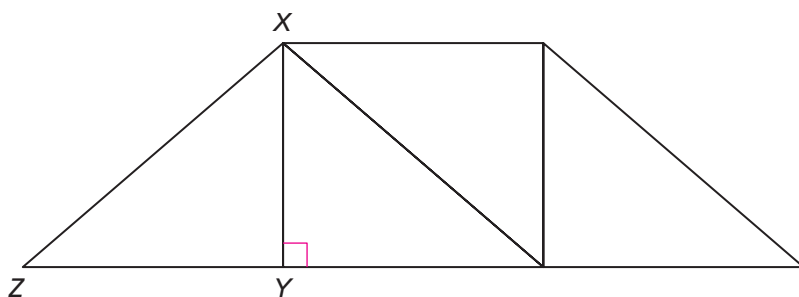
11. In $\triangle FGH$ at the right, \overline{FM} and \overline{GN} are on lines of symmetry. What does this symmetry tell you about
- the angle measures in $\triangle FGH$?
 - the side lengths of $\triangle FGH$?



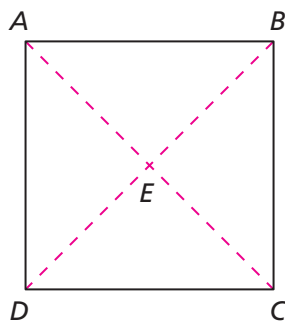
12. Pentagon $PQRST$ at the right has rotational symmetry about point C with a 72° angle of rotation. What does this symmetry tell you about
- the angle measures of $PQRST$?
 - the sides lengths of $PQRST$?
 - the segments from C to each of the vertices?



13. $\triangle XYZ$ was transformed several times. The quadrilateral below is formed from $\triangle XYZ$ and its images.



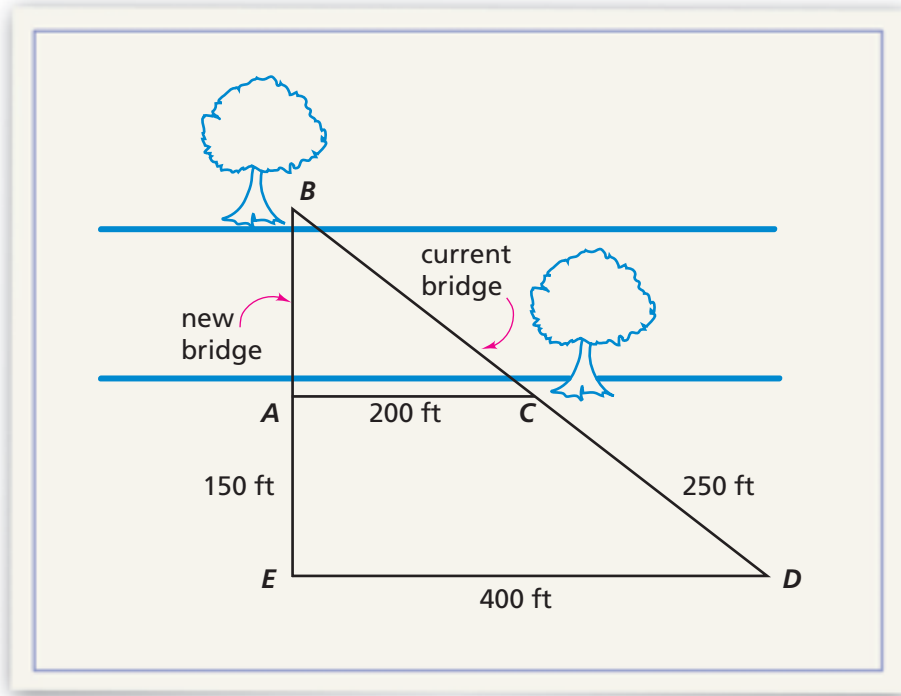
- a. Tell which transformations might have been applied to $\triangle XYZ$ and in what order.
- b. What type of quadrilateral resulted from the transformations? Explain.
14. Use what you know about congruent triangles to show that the diagonals of the square are congruent.



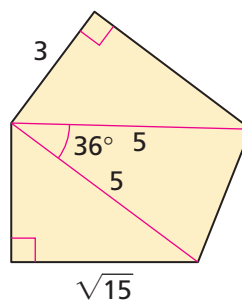
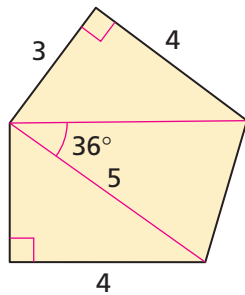
15. **Multiple Choice** Squares, rectangles, and rhombuses are all types of parallelograms. Which statement is true for all parallelograms?
- A. The diagonals are congruent.
- B. Each diagonal divides the other diagonal into two equal-sized pieces. (Another way to say this is that the diagonals bisect each other.)
- C. The diagonals are perpendicular.
- D. The diagonals bisect the angles at the vertices.

Connections

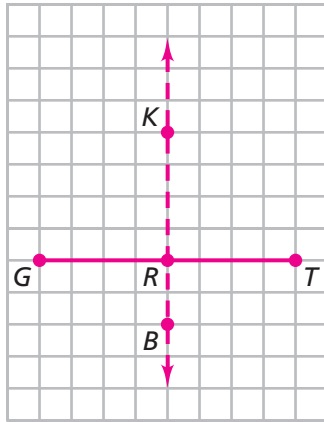
16. The engineer from Problem 4.1 decides to use similar triangles instead of congruent triangles to find the distance across the river. She makes the diagram below.



- a. Which triangles appear to be similar? What must the engineer know about these triangles to conclude that they are similar?
- b. Find the distance across the river from point B to point A . Explain how you found your answer.
17. To decide whether two polygons are congruent, you can divide them into triangles and compare the triangles. Are the pentagons below congruent? If not, which one has the greater area? Explain.

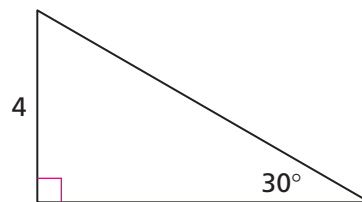
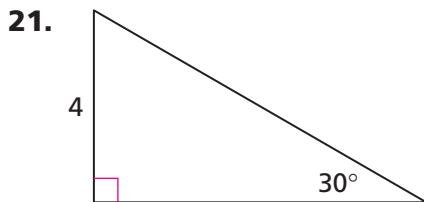
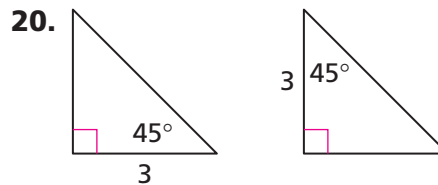
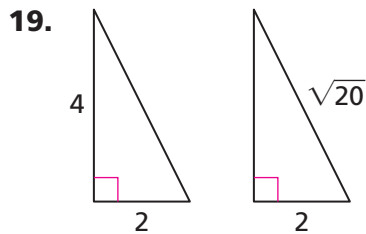


- 18.** In the diagram below, line KB intersects \overline{GT} at right angles and divides it into two congruent segments. Line KB is called the *perpendicular bisector* of \overline{GT} .

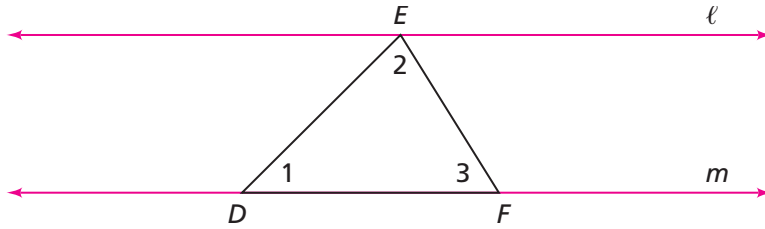


- Is the distance from point K to point G the same as the distance from point K to point T ? Explain.
- Is the distance from point B to point G the same as the distance from point B to point T ?
- Are there any other points on line KB that are the same distance from point G and point T ?

For Exercises 21–23, tell whether the triangles are congruent. Explain your reasoning.

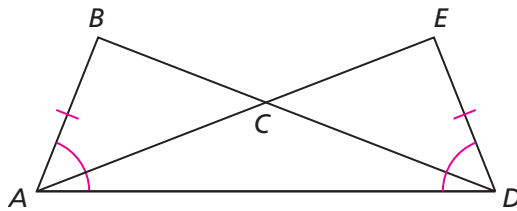


22. In the diagram below, line ℓ is parallel to line m . \overline{DF} lies on line m , and point E lies on line ℓ . How can you use the diagram to show that the sum of the angles in triangle $\triangle DEF$ is 180° ?

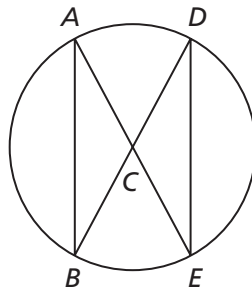


Extensions

23. In the figure below, \overline{AB} is congruent to \overline{DE} and $\angle BAD$ is congruent to $\angle EDA$. Use this information to show $\triangle ABC$ is congruent to $\triangle DEC$.



24. Point C is the center of the circle. \overline{AE} and \overline{BD} pass through point C . Show that $\triangle ABC$ is congruent to $\triangle DEC$.



25. Show that the diagonals of the rhombus are perpendicular.

