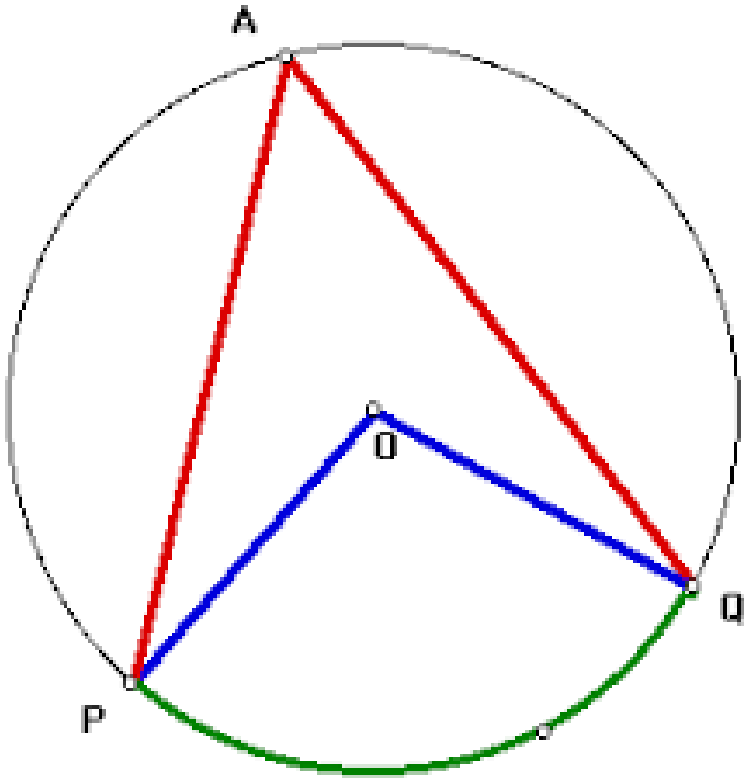
WARM UP

1) Find $m\angle POQ$

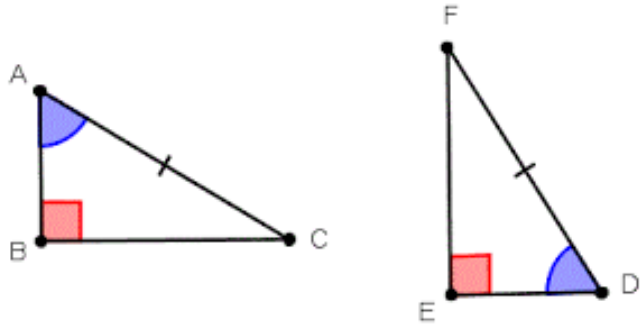
2) Find $m\angle PAQ$

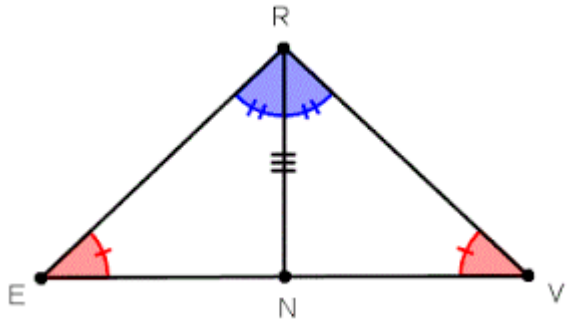
3) Find $mPAQ$



ACTIVITY
4.4

More Triangle Congruence Theorems



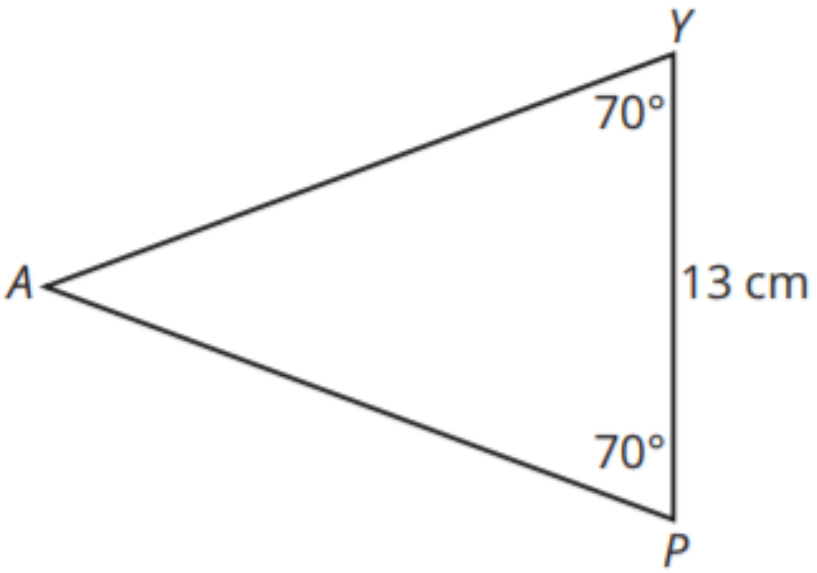


Because you have demonstrated these relationships are true, you can now refer to them as a theorems. The **Hypotenuse-Angle (HA) Congruence Theorem** states: "If the hypotenuse and an acute angle of one right triangle are congruent to the hypotenuse and an acute angle of another right triangle, then the two triangles are congruent." The **Angle-Angle-Side (AAS) Congruence Theorem** states: "If two angles and the non-included side of one triangle are congruent to two angles and the non-included side of another triangle, then the two triangles are congruent."

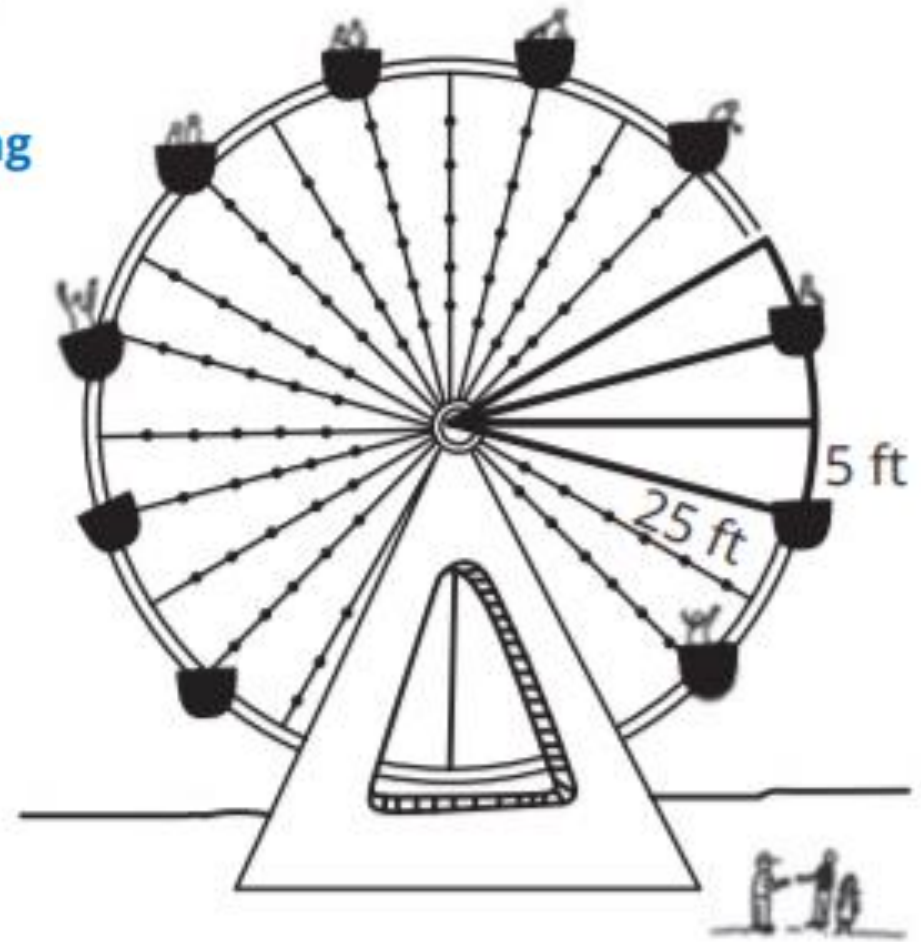
ACTIVITY 4.5

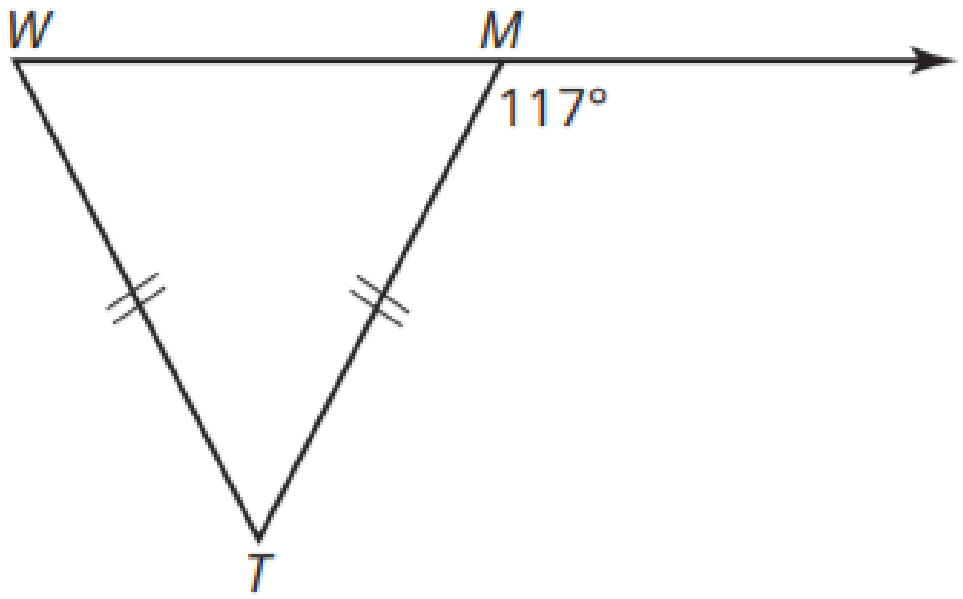
Solving Problems with Congruence

1. Calculate *AP* if the perimeter of △*AYP* is 43 cm.



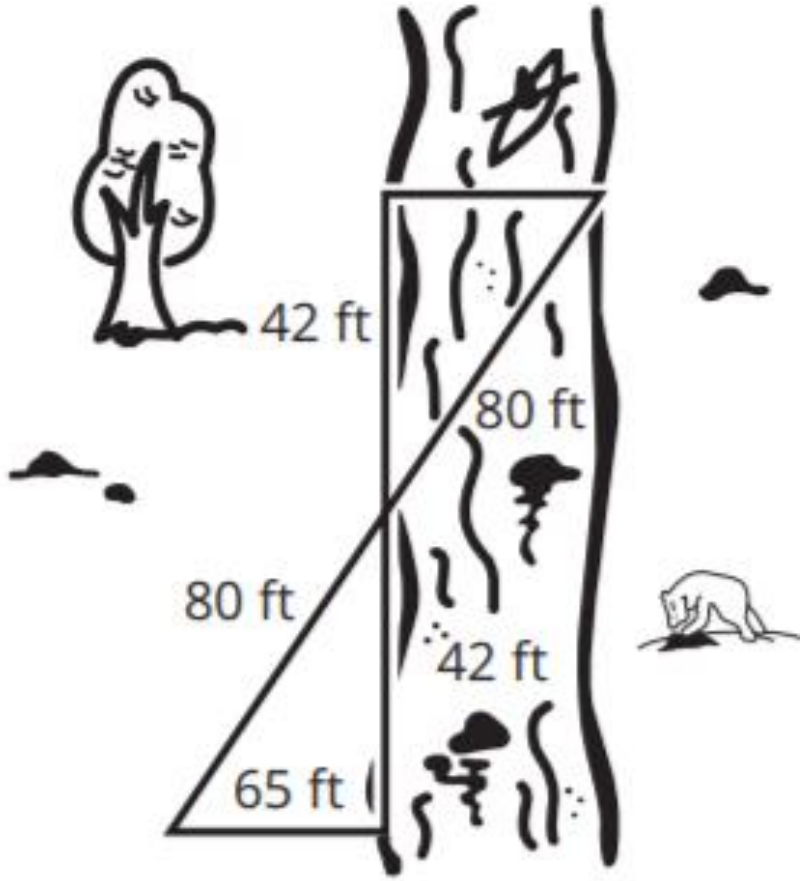
2. **Lighting booms on a Ferris wheel consist of four steel beams that have cabling with light bulbs attached. These beams, along with three shorter beams, form the edges of three congruent isosceles triangles, as shown. Maintenance crews are installing new lighting along the four beams. Calculate the total length of lighting needed for the four beams.**



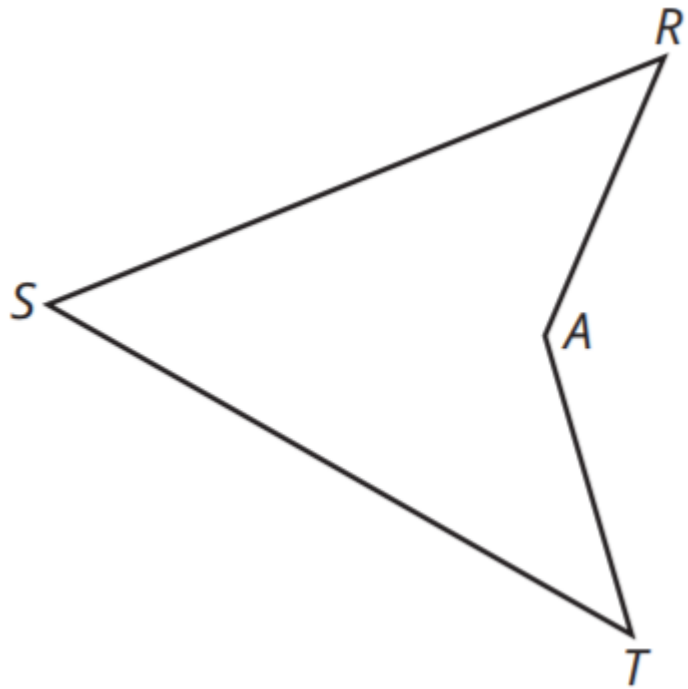


3. Calculate m∠*T*.

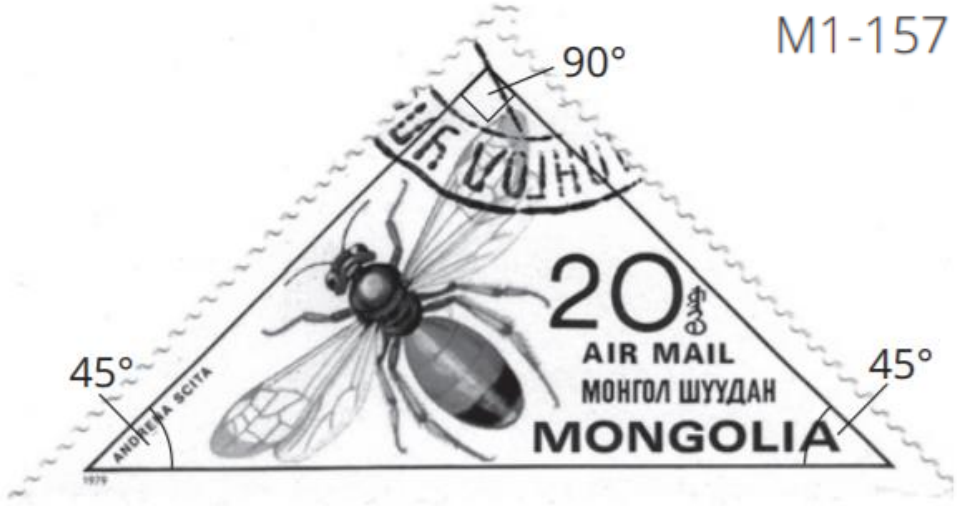
4. What is the width of the river?



5. Given: $\overline{ST} \cong \overline{SR}$, $\overline{TA} \cong \overline{RA}$
Explain why $\angle T \cong \angle R$.



6. **This stamp was issued in Mongolia. Suppose the longest side of this stamp is 50 millimeters.**



   a. **Use the Pythagorean Theorem to determine the approximate length of the other sides of this stamp. Round your answer to the nearest tenth of a millimeter.**

   b. **Use the 45°-45°-90° Triangle Theorem to determine the approximate length of the other sides of this stamp. Round your answer to the nearest tenth of a millimeter.**

7. A broadcast antenna is situated on top of a tower. The signal travels from the antenna to your house so you can watch TV. Consider the diagram to calculate the height of the tower and the distance the signal travels.