Lesson 2.02
Congruent Triangles

Geometry GT

Recall

If triangle ΔABC is congruent to $\Delta A'B'C'$...

    A. What must be true?

    B. What could possibly be true?

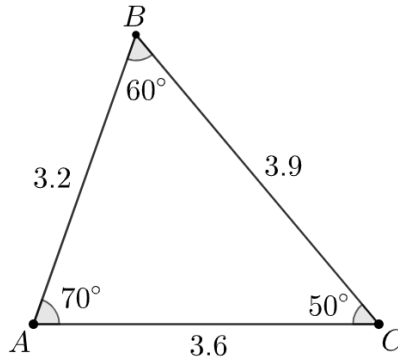   **C.** What definitely can't be true?

Explore

Draw ΔABC with the following measurements:

- $m\angle A = 40°$

- $m\angle B = 20°$

- $m\angle C = 120°$
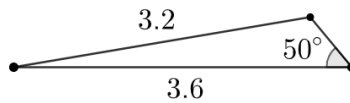
- $AB = 5$cm

- $AC = 2$cm

- $BC = 3.7$cm

Highlight each piece of given information that you used. Check your triangle to make sure the remaining measurements match.
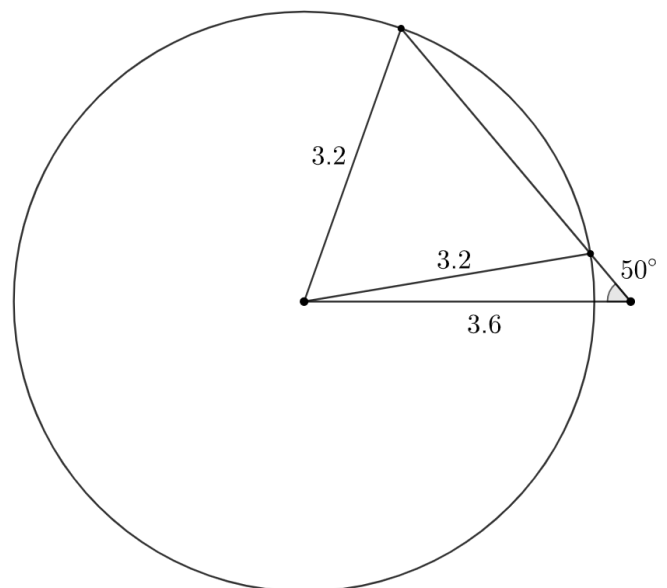
Discuss

Kenan was attempting to draw a triangle that Josh drew without looking at it.

Kenan asks, "can I have two sides and an angle?" Josh said the sides were 3.2cm and 3.6cm, and the angle was 50°.

Is Kenan's triangle congruent to Josh's triangle? Did Kenan do anything that didn't match Josh's description? How could Kenan have been more specific in his request?

Demonstrate

Draw a triangle with the following measurements:

- $m\angle A = 143°$

- $m\angle B = 16°$

- $m\angle C = 21°$

Compare your triangle with a neighbor's. Are they congruent?

What additional information might you need?

Practice

1. Triangle ΔABC is congruent to triangle ΔEDF. Thus, there is a sequence of rigid motions that takes ΔABC to ΔEDF. Select **all** true statements after the transformation.

A. $\angle A$ coincides with $\angle F$

B. $\angle B$ coincides with $\angle D$

C. $\overline{AC}$ coincides with $\overline{EF}$

D. $\overline{BC}$ coincides with $\overline{ED}$

E. $\overline{AB}$ coincides with $\overline{ED}$
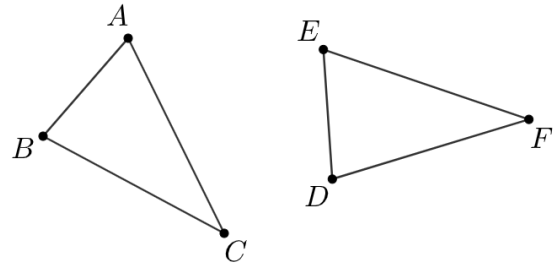
2. Sketch the unique triangles that can be made with angles measuring 40° and 100° and side length 3. How do you know you have sketched all possibilities?

3. In the figure, $\Delta ABC \cong \Delta ZXY$. Describe a sequence of rigid motions that will take ΔABC onto ΔZXY.
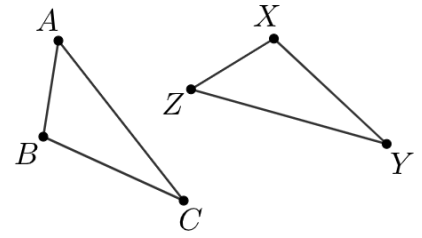
4. Match each statement using only the information shown in the pairs of congruent triangles.

    A. In the two triangles there are three pairs of congruent sides

    B. The two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle

    C. The two angles and the included side of one triangle are congruent to two angles and the included side of another triangle
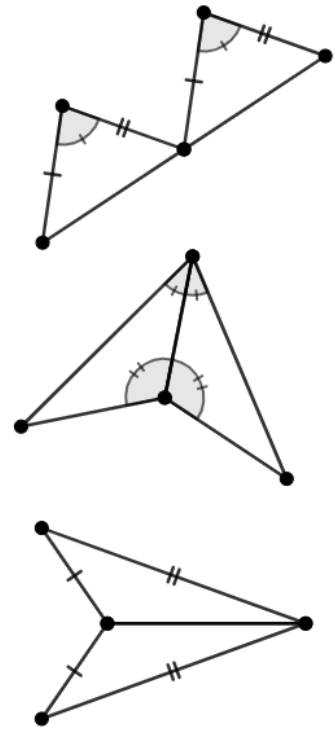
5. What is the least amount of information that you need to construct a triangle congruent to this one?