Unit 2, Lesson 4

Congruent Triangles, Part 2

Let's figure out if there are shortcuts for being sure two triangles are congruent.

4.1 Make That Triangle

Draw triangle ABC with these measurements:

- Angle A is 40 degrees.
- Angle B is 20 degrees.
- Angle C is 120 degrees.
- Segment AB is 5 centimeters.
- Segment AC is 2 centimeters.
- Segment BC is 3.7 centimeters.

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

4.2 Info Gap: Too Much Information

Your teacher will give you either a problem card or a data card. Do not show or read your card to your partner.

If your teacher gives you the problem card:

1. Silently read your card, and think about what information you need to answer the question.
2. Ask your partner for the specific information that you need. "Can you tell me _____?"
3. Explain to your partner how you are using the information to solve the problem. "I need to know _____ because . . . ." Continue to ask questions until you have enough information to solve the problem.
4. Once you have enough information, share the problem card with your partner, and solve the problem independently.
5. Read the data card, and discuss your reasoning.

If your teacher gives you the data card:

1. Silently read your card. Wait for your partner to ask for information.
2. Before telling your partner any information, ask, "Why do you need to know _____?"
3. Listen to your partner's reasoning, and ask clarifying questions. Only give information that is on your card. Do not figure out anything for your partner!
   These steps may be repeated.
4. Once your partner says they have enough information to solve the problem, read the problem card, and solve the problem independently.
5. Share the data card, and discuss your reasoning.

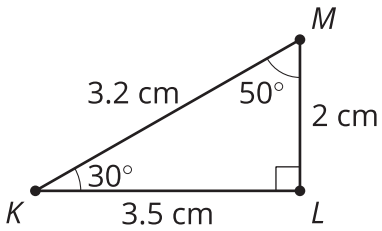
Are you ready for more?

Elena wonders whether she could play the *Information Gap* with area included as an extra piece of information in the data cards. She creates a new card with this information and asks Han to play.

1. If Han asks for 2 sides and the area, do you think this will be enough information for Han to draw a congruent triangle?

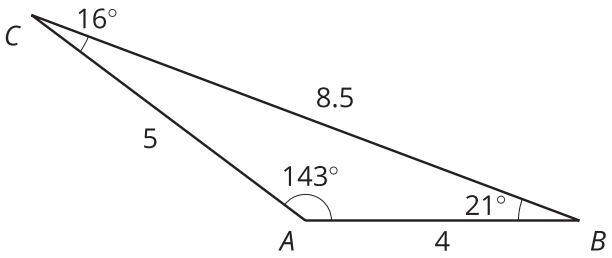
2. If Han asks for 2 angles and the area, do you think this will be enough information for Han to draw a congruent triangle?

Area = 3.5 cm^2



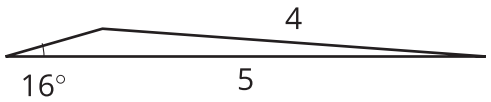
4.3 Too Little Information?

Jada and Tyler were playing the Info Gap, using this triangle.



Tyler asked, "Can I have 2 sides and an angle?"

Jada told Tyler that one angle was 16°, one side was 5 cm, and one side was 4 cm. Here is the triangle Tyler made:



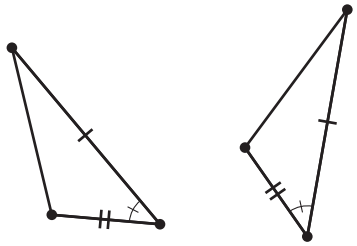
1. Is Tyler's triangle congruent to the triangle on the Data Card?
2. Did Tyler do anything that didn't match Jada's instructions?

3. How could Tyler have made a more specific request for 2 sides and an angle so that his triangle was guaranteed to match Jada's?

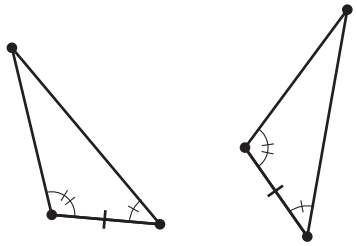
Lesson 4 Summary

If we know that every pair of corresponding parts is congruent, then we know the two triangles are congruent. But we don't need that much information. If we know the angles of a triangle are 30 degrees and 60 degrees, we can figure out that the third angle is 90 degrees. So when we start drawing a triangle, the triangle is complete before we measure every angle. Figuring out which sets of measurements are enough to draw a complete triangle tells us which sets of measurements are enough to prove triangles are congruent. Here are 3 sets of measurements that appear to be enough information to prove that the two triangles will be congruent:

- Two pairs of corresponding sides are congruent, and the angles between those sides are congruent.



- Two pairs of corresponding angles are congruent, and the sides between those angles are congruent.



- Three pairs of corresponding sides are congruent.

