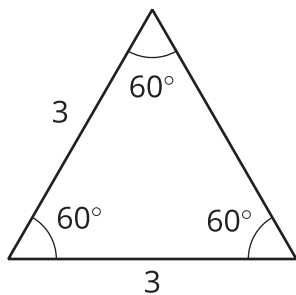# Drawing Triangles (Part 1)

Let's see how many different triangles we can draw with certain measurements.
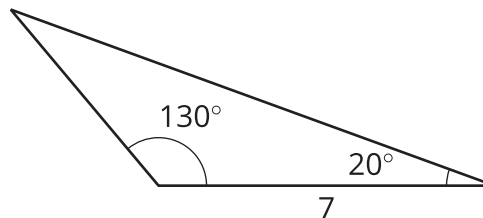
### 9.1 Which Three Go Together: Triangles

Which three go together? Why do they go together?
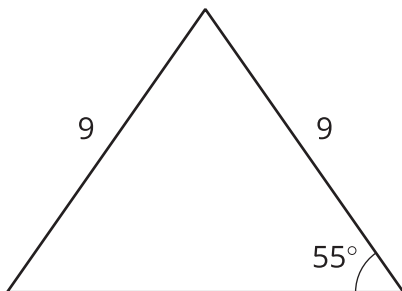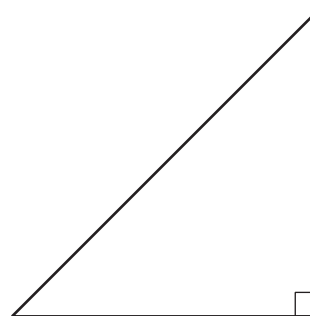
**A**



**B**



**C**



**D**

Three students have each drawn a triangle. For each description:

- Draw a triangle with the given measurements.
- Measure and label the other side lengths and angle measures in your triangle.
- Decide whether the triangle you drew must be an identical copy of the triangle that the student drew. Explain your reasoning.

1. Jada's triangle has one angle measuring 75°.

2. Andre's triangle has one angle measuring 75° and one angle measuring 45°.

3. Lin's triangle has one angle measuring 75°, one angle measuring 45°, and one side measuring 5 cm.

1. Draw as many different triangles as you can with each of these sets of measurements:

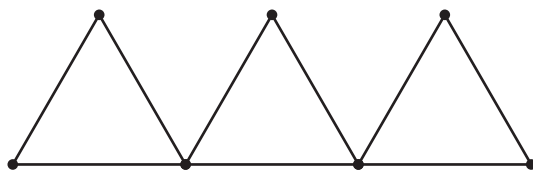    a. Two angles measure $60°$, and one side measures 4 cm.

    b. Two angles measure $90°$, and one side measures 4 cm.

c.  One angle measures $60°$, one angle measures $90°$, and one side measures 4 cm.

2.  Which of these sets of measurements determine one unique triangle? Explain or show your reasoning.

💡 **Are you ready for more?**



In the diagram, 9 toothpicks are used to make three equilateral triangles. Figure out a way to move only 3 of the toothpicks so that the diagram has exactly 5 equilateral triangles.

## 👤 Lesson 9 Summary

Sometimes, we are given two different angle measures and a side length, and it is impossible to draw a triangle. For example, there is no triangle with side length 2 and angle measures 120° and 100°:
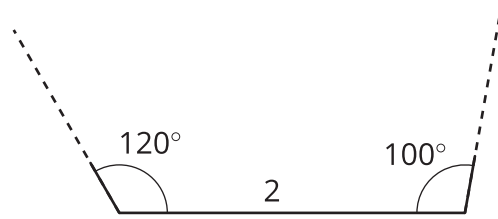
Sometimes, we are given two different angle measures and a side length between them, and we *can* draw a unique triangle. For example, if we draw a triangle with a side length of 4 between angles 90° and 60°, there is only one way in which they can meet up and make a triangle:
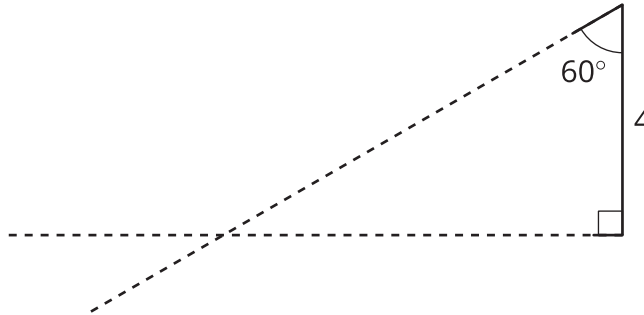
Any triangle drawn with these three conditions will be identical to the one above, with the same side lengths and the same angle measures.