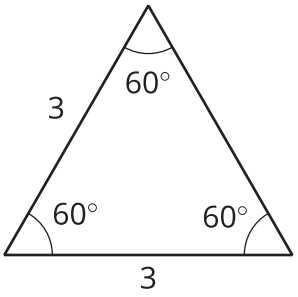
Drawing Triangles (Part 1)

Let's see how many different triangles we can draw with certain measurements.

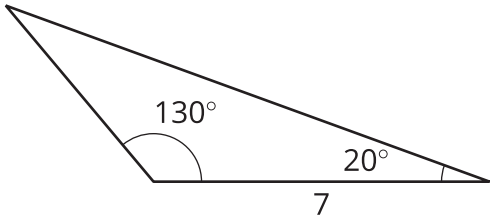
9.1 Which Three Go Together: Triangles

Which three go together? Why do they go together?

A



B



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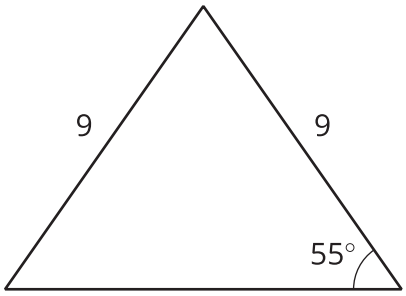
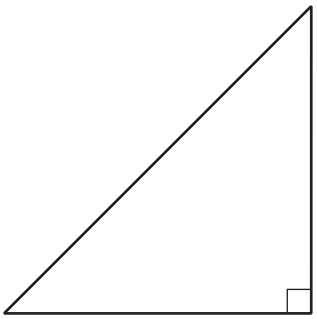


D



9.2 Does Your Triangle Match Theirs?

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.

9.3 How Many Can You Draw?

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

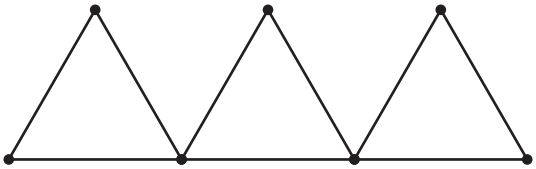
   a. Two angles measure 60°, and one side measures 4 cm.

   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.

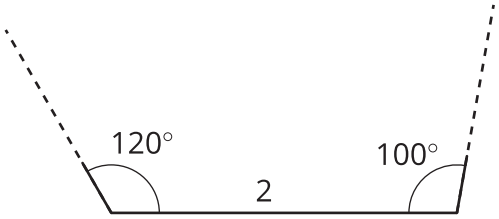
Are you ready for more?



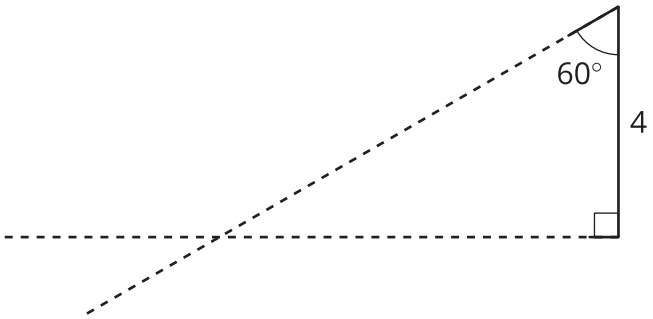
In the diagram, 9 toothpicks are used to make three equilateral triangles. Figure out a way to move only 3 of the toothpicks so that the diagram has exactly 5 equilateral triangles.

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.