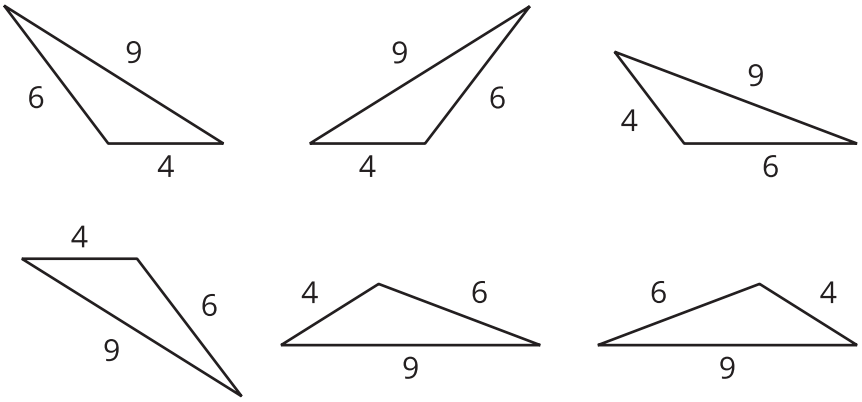
Drawing Triangles (Part 1)

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

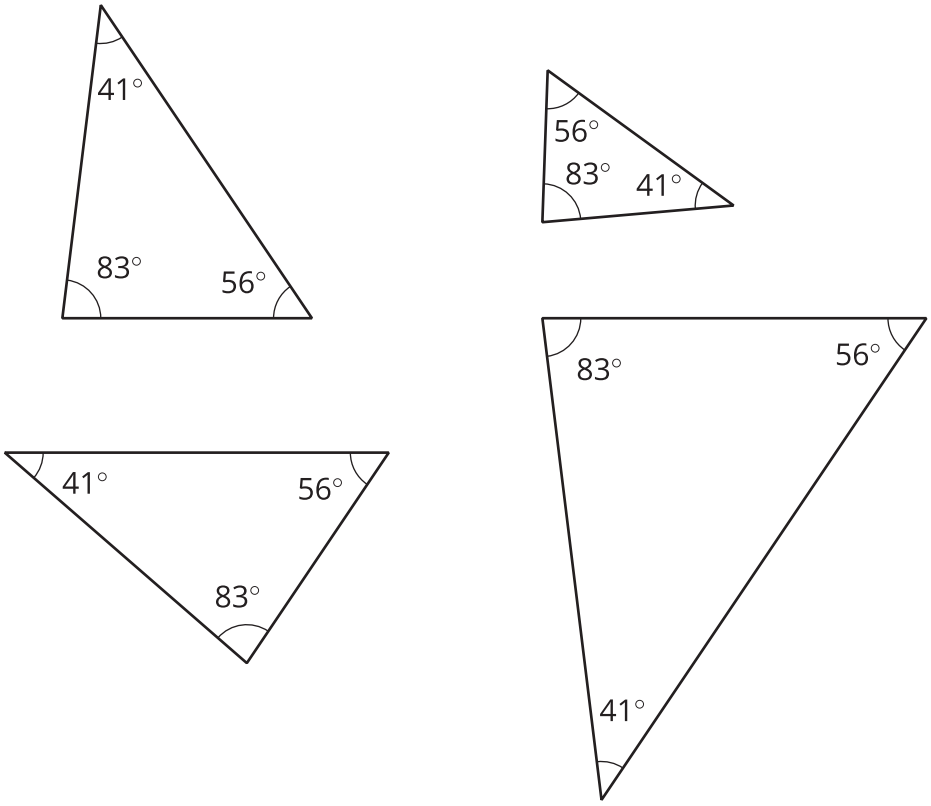
16.1 3 Sides; 3 Angles

Examine each set of triangles. What do you notice? What is the same about the triangles in the set? What is different?

Set 1:



Set 2:



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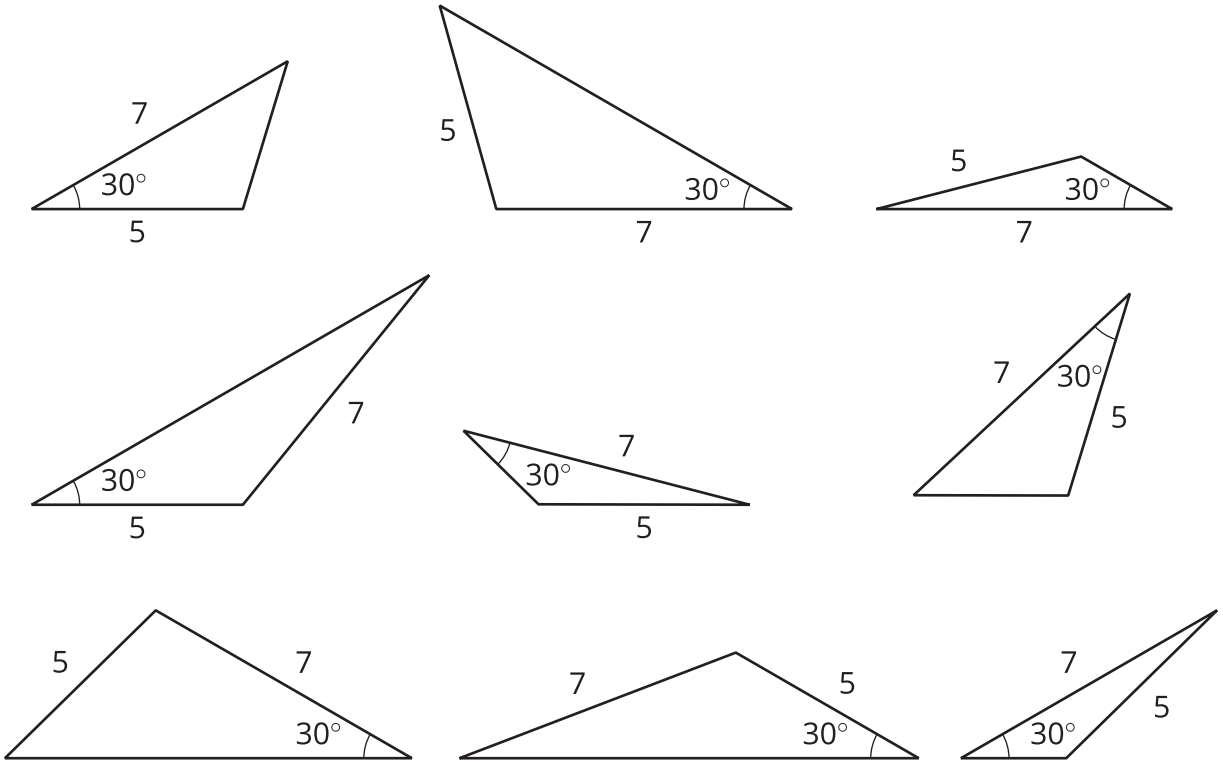
16.2 2 Sides and 1 Angle

Examine this set of triangles.



1. What is the same about the triangles in the set? What is different?

2. How many different triangles are there? Explain or show your reasoning.

16.3 How Many Can You Draw?

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

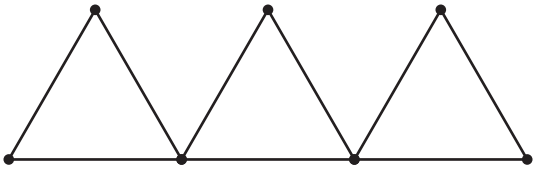
   a. Two angles measure 60°, and one side measures 4 cm.

   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?

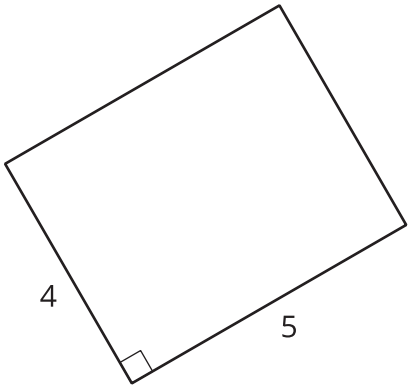


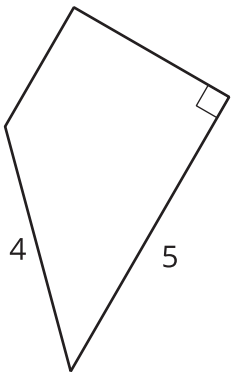
In the diagram, 9 toothpicks are used to make three equilateral triangles. Figure out a way to move only 3 of the toothpicks so that the diagram has exactly 5 equilateral triangles.

Lesson 16 Summary

Both of these quadrilaterals have a right angle and side lengths 4 and 5:

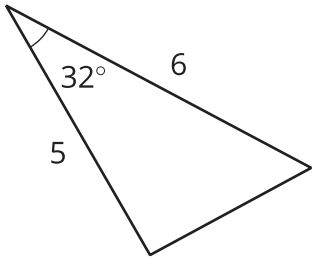
However, in one case, the right angle is *between* the two given side lengths, and in the other, it is not.

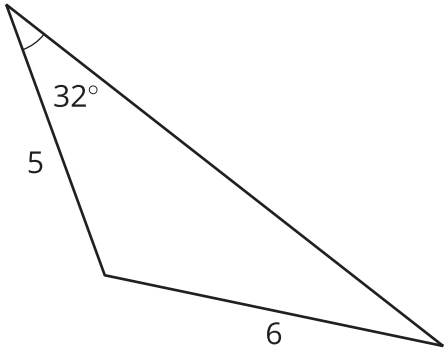




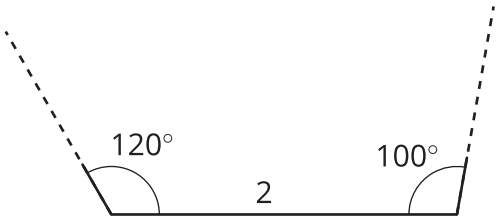
If we create two triangles with three equal measures, but these measures are not next to each other in the same order, that usually means that the triangles are different.

Here is an example:

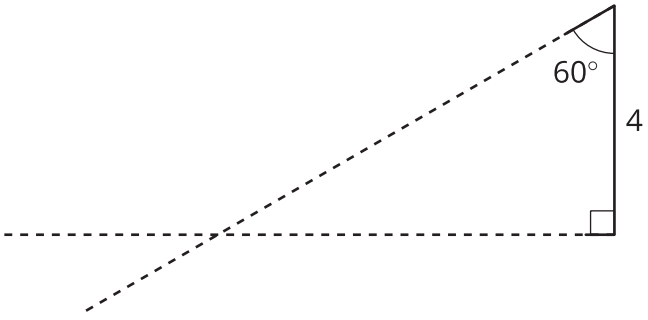




Sometimes, we are given two different angle measures and a side length, and it is impossible to draw a triangle. For example, there is no triangle with side length 2 and angle measures 120° and 100°:



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.

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