



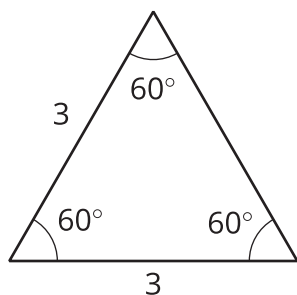
# Drawing Triangles (Part 1)

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

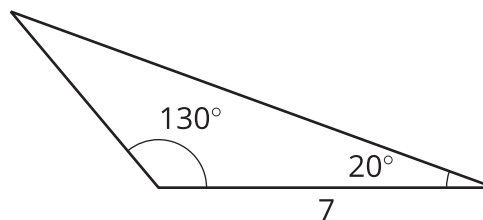
## 9.1 Which Three Go Together: Triangles

Which three go together? Why do they go together?

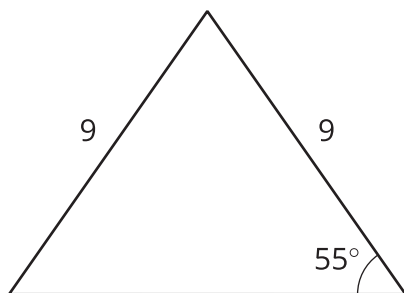
**A**



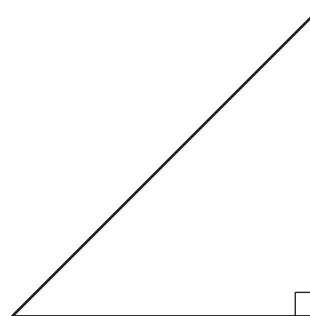
**B**



**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  $75^\circ$ .
2. Andre's triangle has one angle measuring  $75^\circ$  and one angle measuring  $45^\circ$ .
3. Lin's triangle has one angle measuring  $75^\circ$ , one angle measuring  $45^\circ$ , 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  $60^\circ$ , and one side measures 4 cm.

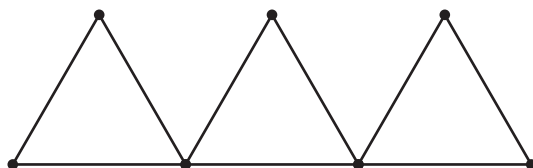
b. Two angles measure  $90^\circ$ , and one side measures 4 cm.



c. One angle measures  $60^\circ$ , one angle measures  $90^\circ$ , 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?**



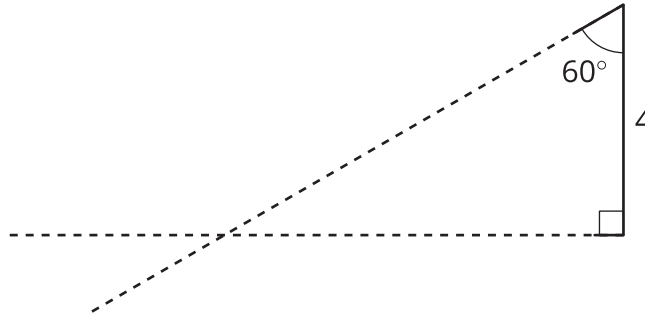
In the diagram, 9 toothpicks are used to make three equilateral triangles. Figure out a way to move only 3 of the toothpicks so that the diagram has exactly 5 equilateral triangles.

## 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  $120^\circ$  and  $100^\circ$ :



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  $90^\circ$  and  $60^\circ$ , 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.