

## Lesson 8: Drawing Triangles

### Classwork

#### Opening Exercises 1–2

1. Use your protractor and ruler to draw a right triangle . Label all sides and angle measurements.
  - a. Predict how many of the right triangles drawn in class are identical to the triangle you have drawn.
  - b. How many of the right triangles drawn in class are identical to the triangle you drew? Were you correct in your prediction?
2. Given the following three sides of triangle , use your compass to copy the triangle. The longest side has been copied for you already. Label the new triangle as and indicate all side and angle measurements. For a reminder of how to begin, refer to Lesson 6, Exploratory Challenge question 10.

A \_\_\_\_\_ B

B \_\_\_\_\_ C

A \_\_\_\_\_ C

A \_\_\_\_\_ C

**Exploratory Challenge**

- a. A triangle is to be drawn provided the following conditions: the measurement of two angles is      and      and the length of a side is      cm. Note that *where* each of these measurements is positioned is not fixed. How is the premise of this problem different from Opening Exercise 2?
- b. Do you think it will be possible to draw more than one triangle with these provided measurements so that the triangles drawn will be different from each other? Or do you think attempting to draw more than one triangle with these measurements will just keep producing the same triangle, just turned around or flipped about?
- c. Based on the provided measurements, draw triangle      so that      ,      , and      cm. Describe how the      cm side is positioned.

d. Now, using the same measurements, draw triangle so that , , and cm.

e. Lastly, again, using the same measurements, draw triangle so that , , and cm.

f. Are the three drawn triangles identical? Justify your response using measurements.

g. Draw triangle \_\_\_\_\_ so that \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ cm. Is it identical to any of the three triangles already drawn?

h. Draw another triangle that meets the criteria of this challenge. Is it possible to draw any other triangles that would be different from the three drawn above?

**Problem Set**

1. Draw three different acute triangles , , and so that one angle in each triangle is . Label all sides and angle measurements. Why are your triangles not identical?
2. Draw three different equilateral triangles , , and . A side length of is cm. A side length of is cm. A side length of is cm. Label all sides and angle measurements. Why are your triangles not identical?
3. Draw as many isosceles triangles that satisfy the following conditions: one angle measures and one side measures cm. Label all angle and side measurements. How many triangles can be drawn under these conditions?
4. Draw three non-identical triangles so that two angles measure and and one side measures cm.
  - a. Why are the triangles not identical?
  - b. Based on the diagrams you drew for part (a) and for Problem 2, what can you generalize about the criterion of three given angles in a triangle? Does this criterion determine a unique triangle?