Corresponding Parts and Scale Factors

Let's describe features of scaled copies.

2.1 Math Talk: Multiplying by a Unit Fraction

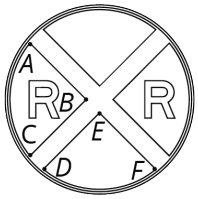
Find the value of each expression mentally.

- $\frac{1}{4} \cdot 20$
- $44 \cdot \frac{1}{4}$
- $\frac{1}{3} \cdot 63$
- $90 \cdot \frac{1}{6}$

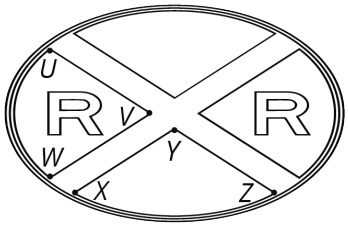
2.2 Corresponding Parts

Here is a figure and two copies, each with some points labeled.

ORIGINAL



COPY 1



COPY 2

1. Complete this table to show **corresponding parts** in the three figures.

original	copy 1	copy 2
point P		
segment LM		
	segment EF	
		point W
angle KLM		
		angle XYZ

2. Is either copy a scaled copy of the original figure? Explain your reasoning.

3. Use tracing paper to compare angle KLM with its corresponding angles in Copy 1 and Copy 2. What do you notice?

4. Use tracing paper to compare angle NOP with its corresponding angles in Copy 1 and Copy 2. What do you notice?

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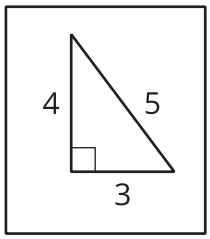
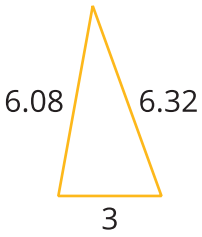
2.3 Scaled Triangles

Here is Triangle O, followed by a number of other triangles.

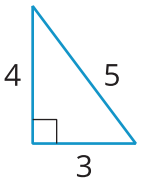
O



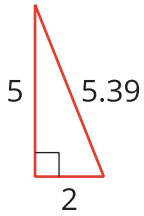
A



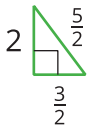
B



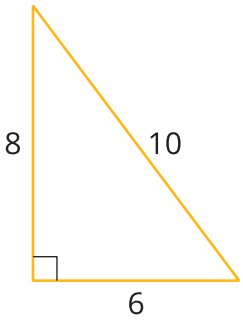
C



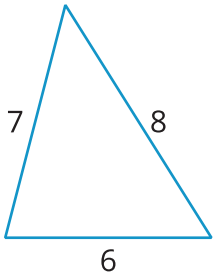
D



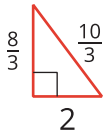
E



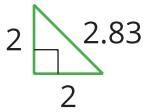
F



G



H



Your teacher will assign you two of the triangles to look at.

1. For each of your assigned triangles, is it a scaled copy of Triangle O? Be prepared to explain your reasoning.
2. As a group, identify *all* the scaled copies of Triangle O in the collection. Discuss your thinking. If you disagree, work to reach an agreement.
3. List all the triangles that are scaled copies in the table. Record the side lengths that correspond to the side lengths of Triangle O listed in each column.

Triangle O	3	4	5

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4. Explain or show how each copy has been scaled from the original (Triangle O).

Are you ready for more?

Choose one of the triangles that is not a scaled copy of Triangle O. Describe how you could change at least one side to make a scaled copy, while leaving at least one side unchanged.

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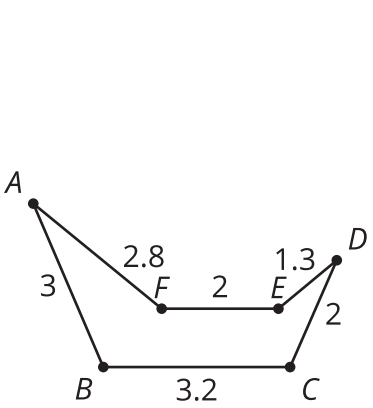
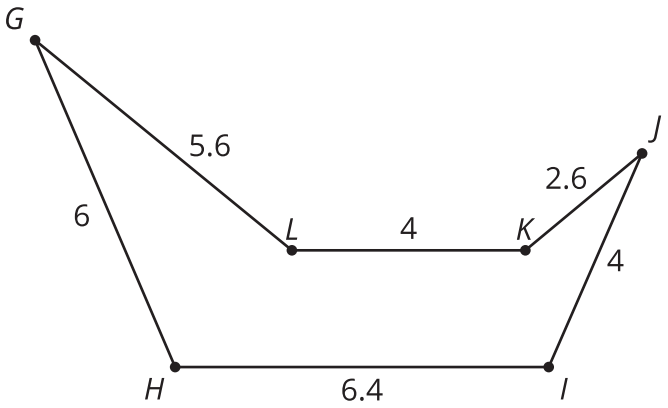
Lesson 2 Summary

A figure and its scaled copy have **corresponding parts**, or parts that are in the same position in relation to the rest of each figure. These parts could be points, segments, or angles. For example, Polygon 2 is a scaled copy of Polygon 1.



Polygon 1



Polygon 2

- Each point in Polygon 1 has a *corresponding point* in Polygon 2.
  For example, point B corresponds to point H and point C corresponds to point I.
- Each segment in Polygon 1 has a *corresponding segment* in Polygon 2.
  For example, segment AF corresponds to segment GL.
- Each angle in Polygon 1 also has a *corresponding angle* in Polygon 2.
  For example, angle DEF corresponds to angle JKL.

The **scale factor** between Polygon 1 and Polygon 2 is 2, because all of the lengths in Polygon 2 are 2 times the corresponding lengths in Polygon 1. The angle measures in Polygon 2 are the same as the corresponding angle measures in Polygon 1. For example, the measure of angle JKL is the same as the measure of angle DEF.