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# Unit 1, Lesson 2: Corresponding Parts and Scale Factors

Let's describe features of scaled copies.

## 2.1: Number Talk: Multiplying by a Unit Fraction

Find each product mentally.

$$\frac{1}{4} \cdot 32$$

$$(7.2) \cdot \frac{1}{9}$$

$$\frac{1}{4} \cdot (5.6)$$

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## 2.2: Corresponding Parts

m.openup.org/1/7-1-2-2

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?

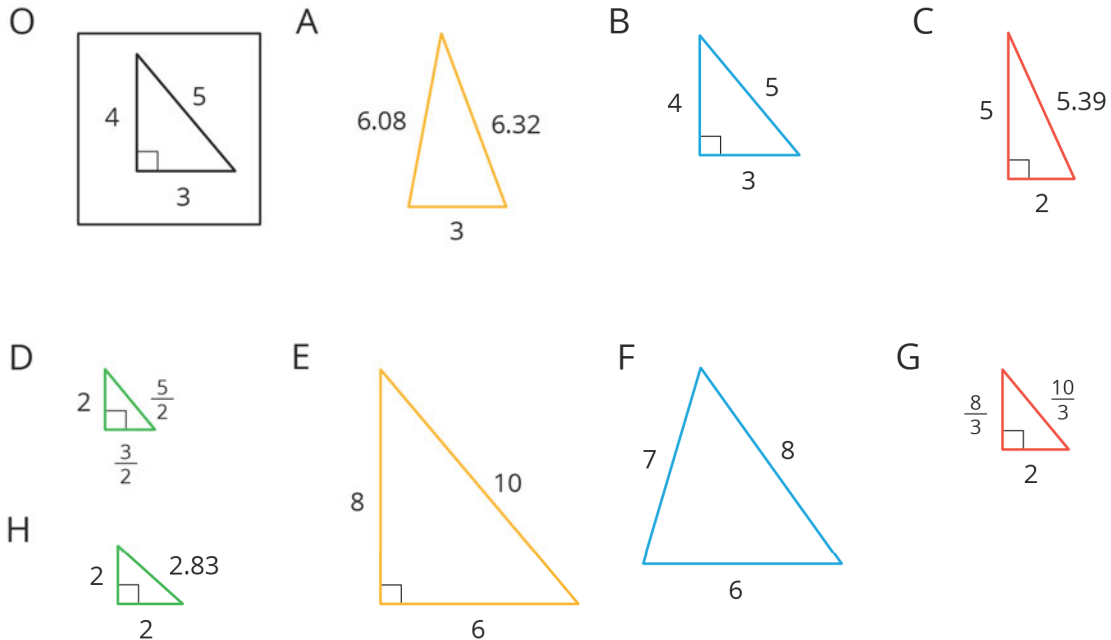
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### 2.3: Scaled Triangles

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



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.

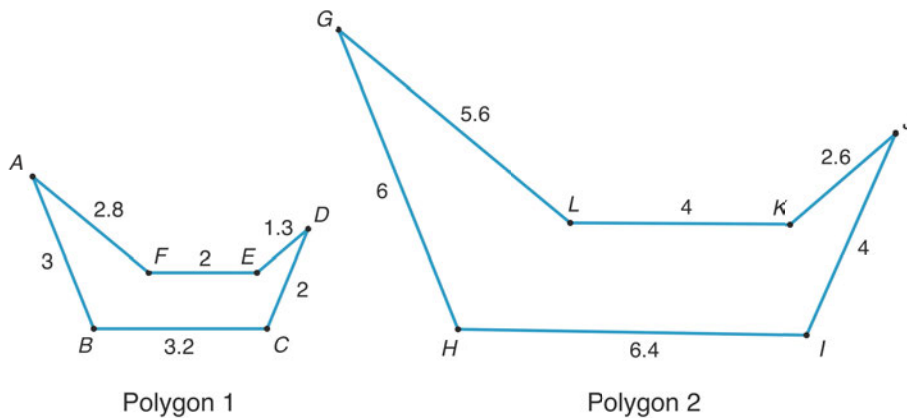
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## Lesson 2 Summary

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.



- 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  $DEF$ .

## Lesson 2 Glossary Terms

- scale factor
- corresponding

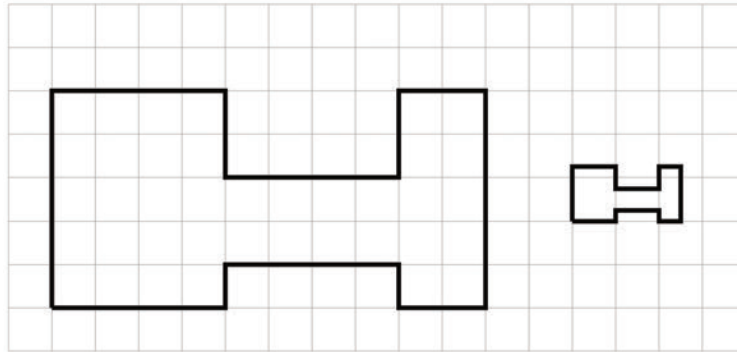
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## Unit 1, Lesson 2: Corresponding Parts and Scale Factors

1. The second H-shaped polygon is a scaled copy of the first.



- Show one pair of corresponding points and two pairs of corresponding sides in the original polygon and its copy. Consider using colored pencils to highlight corresponding parts or labeling some of the vertices.
- What scale factor takes the original polygon to its smaller copy? Explain or show your reasoning.

2. Figure B is a scaled copy of Figure A. Select **all** of the statements that must be true:

- Figure B is larger than Figure A.
- Figure B has the same number of edges as Figure A.
- Figure B has the same perimeter as Figure A.
- Figure B has the same number of angles as Figure A.
- Figure B has angles with the same measures as Figure A.

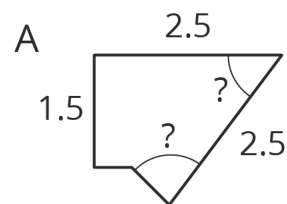
3. Polygon B is a scaled copy of Polygon A.

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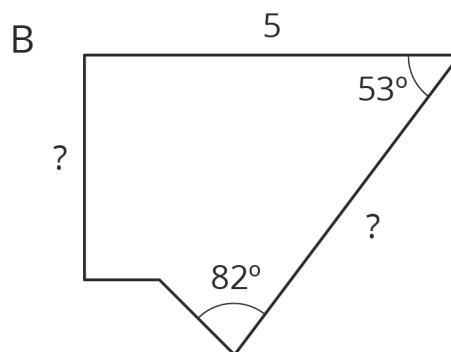
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- a. What is the scale factor from Polygon A to Polygon B?  
Explain your reasoning.



- b. Find the missing length of each side marked with ? in Polygon B.
- c. Determine the measure of each angle marked with ? in Polygon A.



4. Complete each equation with a number that makes it true.

a.  $8 \cdot \underline{\hspace{2cm}} = 40$

b.  $8 + \underline{\hspace{2cm}} = 40$

c.  $21 \div \underline{\hspace{2cm}} = 7$

d.  $21 - \underline{\hspace{2cm}} = 7$

e.  $21 \cdot \underline{\hspace{2cm}} = 7$