IM 6–8 MATH™ v.III

Unit 1
Scale Drawings

7

Lesson 3

Making Scaled Copies

Illustrative Mathematics®

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Learning Goal

Let’s draw scaled copies.

More or Less?

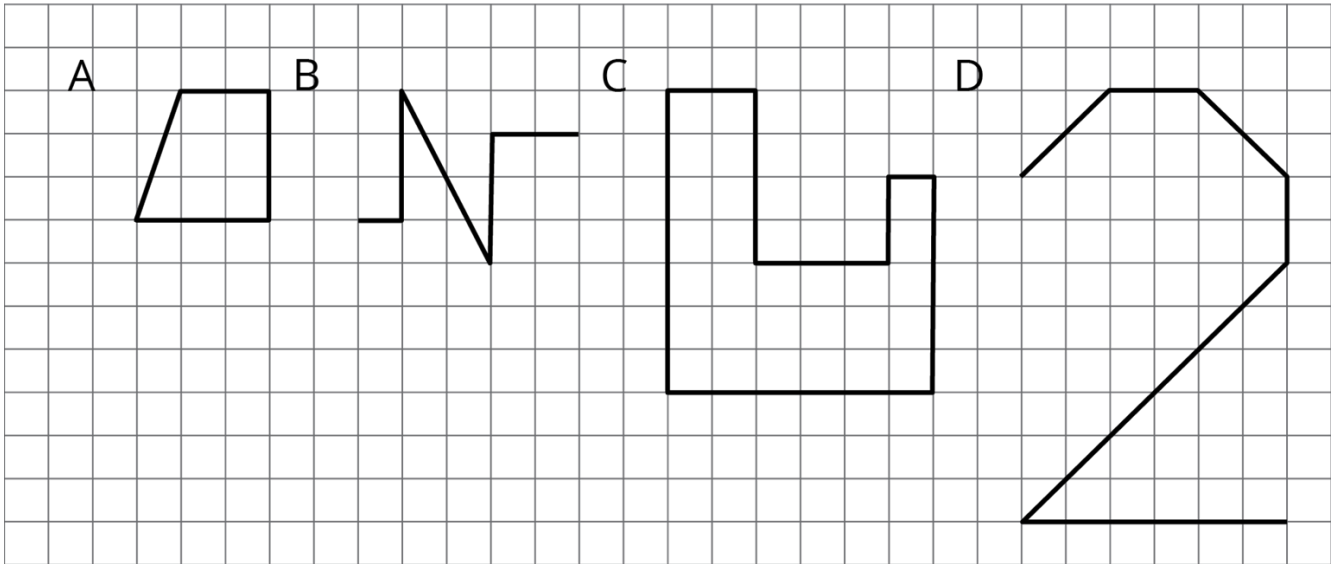
Warm-up

1. The value of 25 • (8.5) is:
   a. More than 205
   b. Less than 205

1. The value of (9.93) • (0.984) is:
   a. More than 10
   b. Less than 10

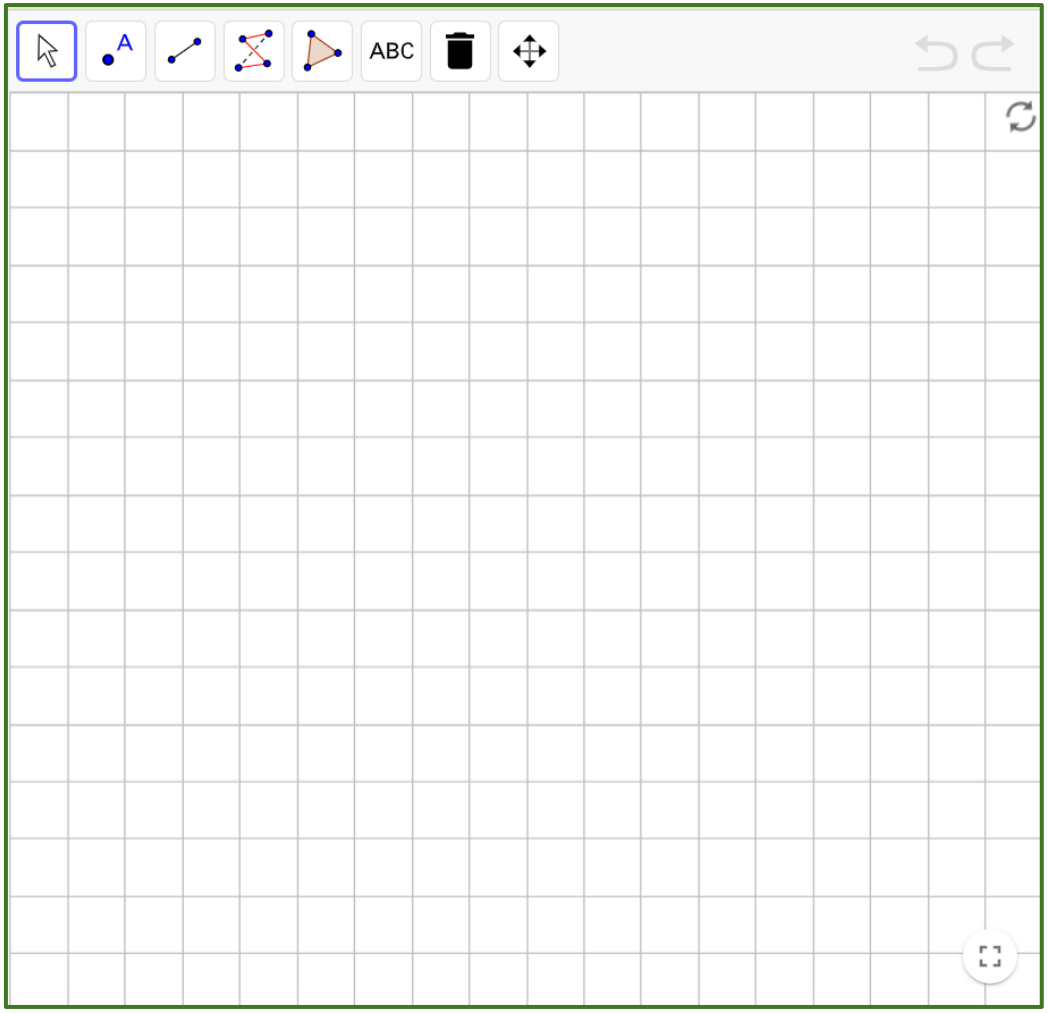
1. The value of (0.24) • (0.67) is:
   a. More than 0.2
   b. Less than 0.2

Drawing Scaled Copies



1. Draw a scaled copy of either Figure A or B using a scale factor of 3.
2. Draw a scaled copy of either Figure C or D using a scale factor of $\frac{1}{2}$.

Drawing Scaled Copies

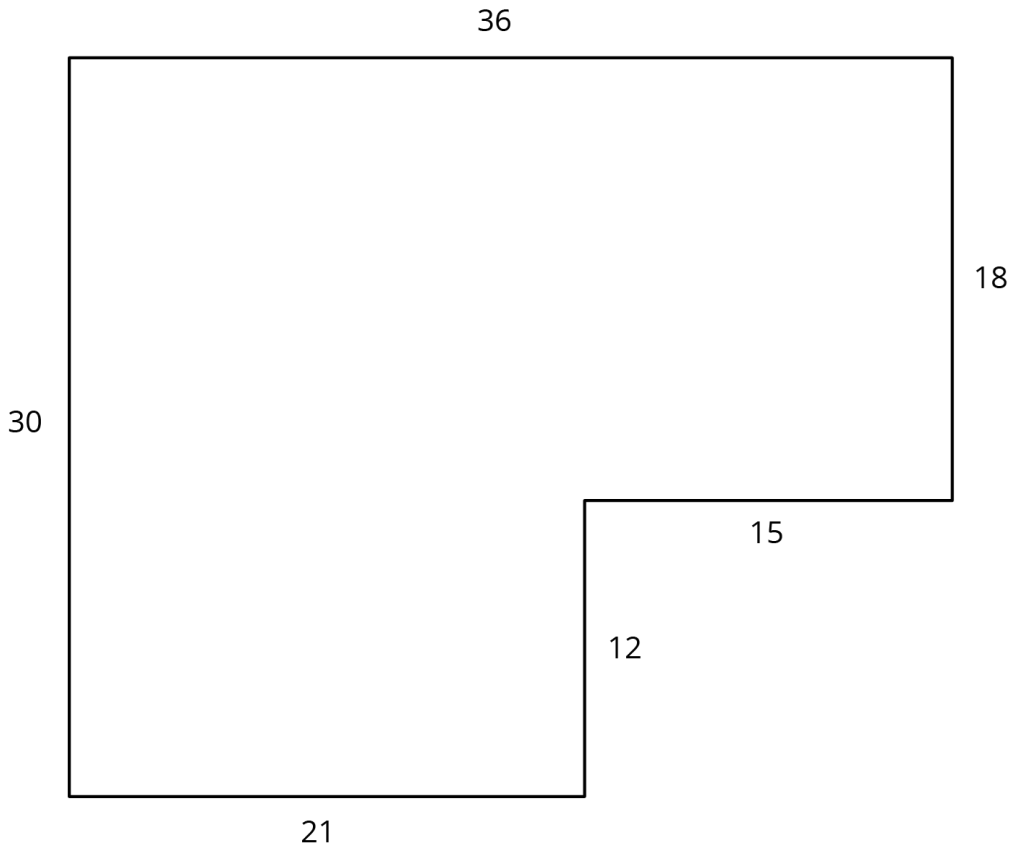


Drawing Scaled Copies

- How did you know how long to make each side in your scaled copy?
- How did you know how big to make each angle in your scaled copy?
- If you made a mistake while drawing your scaled copy, how could you tell?

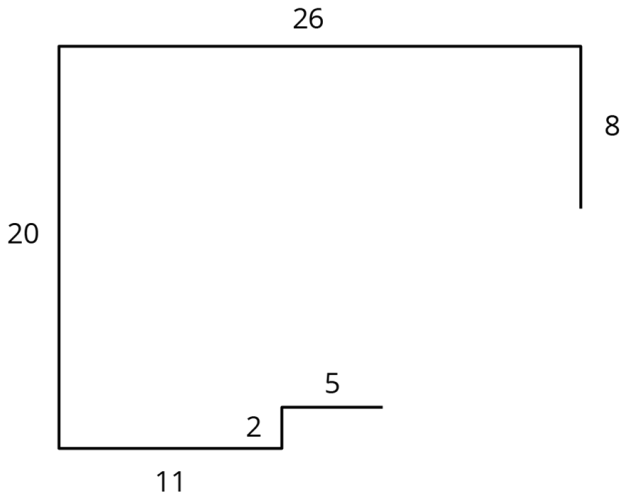
Which Operations? (Part 1)

Diego and Jada want to scale this polygon so the side that corresponds to 15 units in the original is 5 units in the scaled copy.

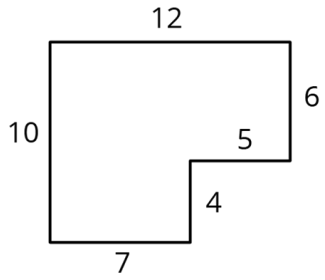


Which Operations? (Part 1)

Diego and Jada each use a different operation to find the new side lengths. Here are their finished drawings.



Diego's drawing



Jada's drawing

1. What operation do you think Diego used to calculate the lengths for his drawing?
2. What operation do you think Jada used to calculate the lengths for her drawing?
3. Did each method produce a scaled copy of the polygon? Explain your reasoning.

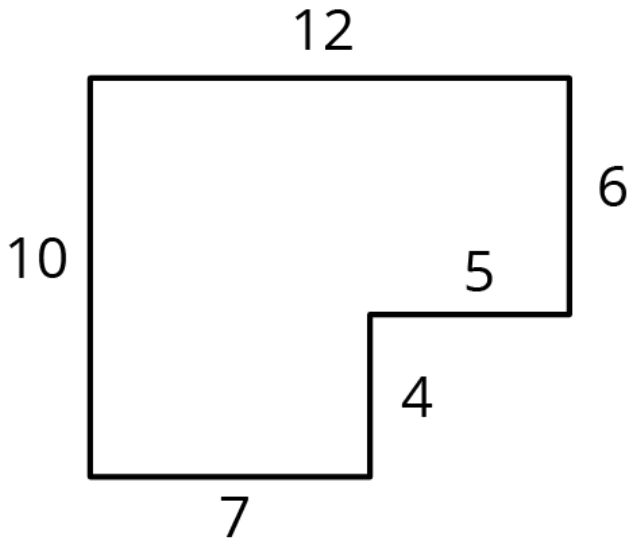
Which Operations? (Part 1)

- What is the scale factor used to create Jada's drawing? What about for Diego's drawing?
- What can you say about the corresponding angles in Jada and Diego's drawings?
- Subtraction of side lengths does not (usually) produce scaled copies.
  Do you think addition would work?

Which Operations? (Part 2)

Andre wants to make a scaled copy of Jada's drawing so the side that corresponds to 4 units in Jada's polygon is 8 units in his scaled copy.

1. Andre says "I wonder if I should add 4 units to the lengths of all of the segments?" What would you say in response to Andre? Explain or show your reasoning.
2. Create the scaled copy that Andre wants. If you get stuck, consider using the edge of an index card or paper to measure the lengths needed to draw the copy.



Jada's drawing

Which Operations? (Part 2)

- What scale factor did you use to create your copy? Why?
- How did you use an index card (or a sheet of paper) to measure the lengths for the copy?
- How did you measure the angles for the copy?

Making Scaled Copies

Lesson Synthesis

- How do we draw a scaled copy of a figure?
- Can we create scaled copies by adding or subtracting the same value from all lengths? Why or why not?

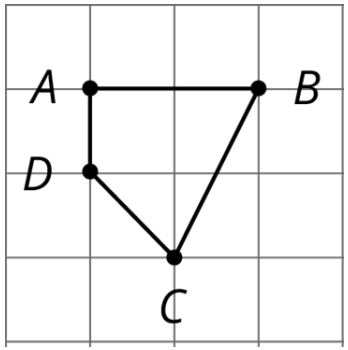
Learning Targets

- I can draw a scaled copy of a figure using a given scale factor.
- I know what operation to use on the side lengths of a figure to produce a scaled copy.

More Scaled Copies

Cool-down

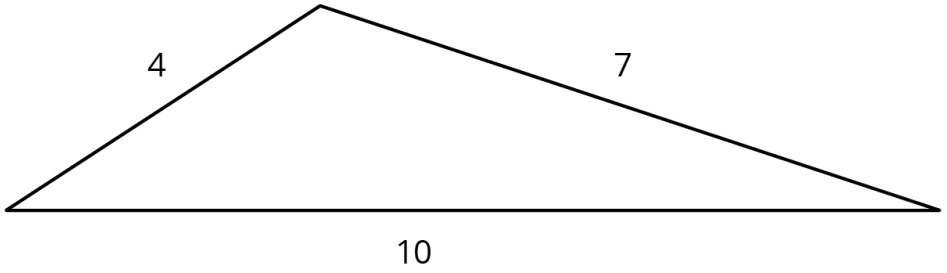
1. Create a scaled copy of *ABCD* using a scale factor of 4.



2. Triangle Z is a scaled copy of Triangle M. Select all the sets of values that could be the side lengths of Triangle Z.

   a. 8, 11, and 14.
   b. 10, 17.5, and 25.
   c. 6, 9, and 11.
   d. 6, 10.5, and 15.
   e. 8, 14, and 20.

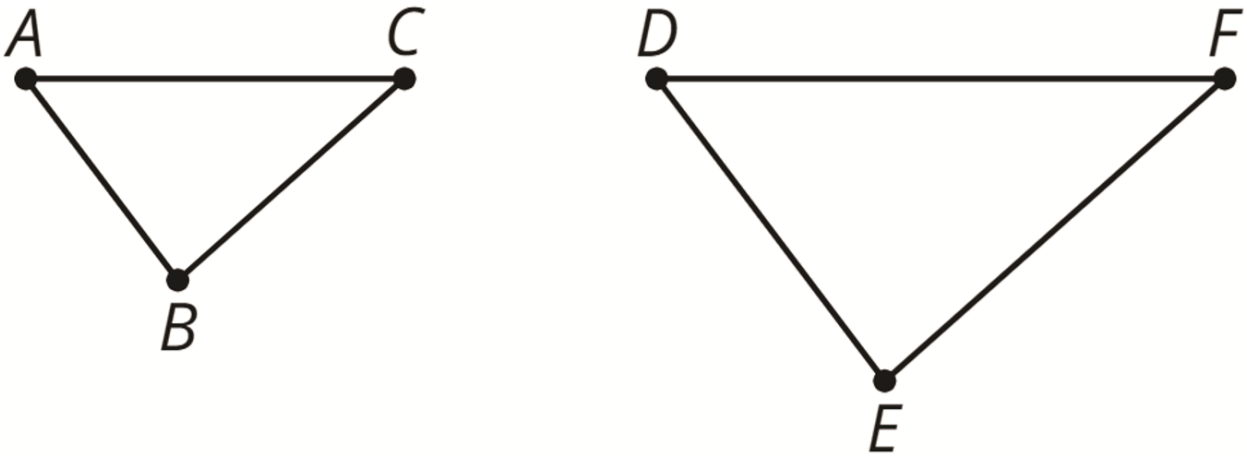
M



corresponding

When part of an original figure matches up with part of a copy, we call them corresponding parts. These could be points, segments, angles, or distances.

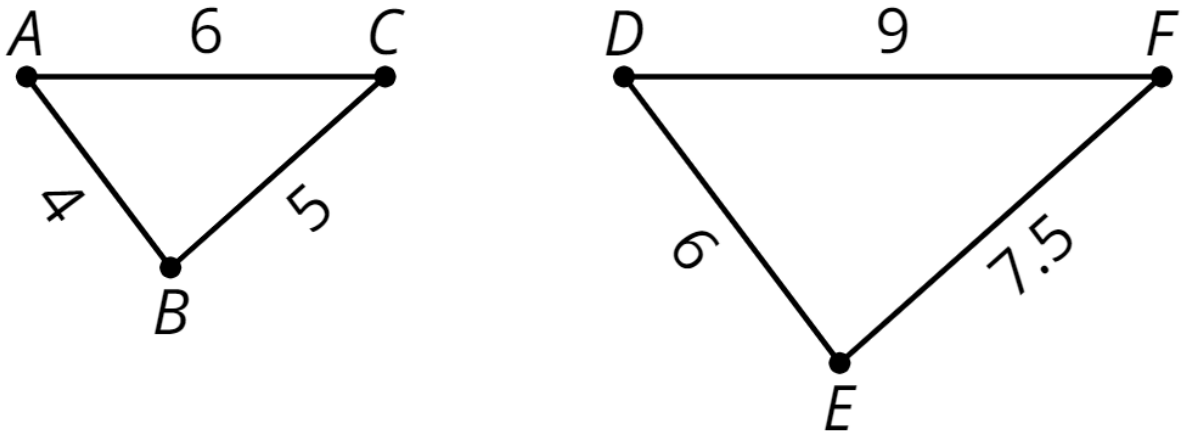
For example, point *B* in the first triangle corresponds to point *E* in the second triangle. Segment *AC* corresponds to segment *DF*.



scale factor

To create a scaled copy, we multiply all the lengths in the original figure by the same number. This number is called the scale factor.

In this example, the scale factor is 1.5, because 4 • (1.5) = 6, 5 • (1.5) = 7.5 and 6 • (1.5) = 9.



scaled copy

A scaled copy is a copy of an figure where every length in the original figure is multiplied by the same number.

For example, triangle *DEF* is a scaled copy of triangle *ABC*. Each side length on triangle *ABC* was multiplied by 1.5 to get the corresponding side length on triangle *DEF*.