Chapter Review

FREQUENTLY ASKED Questions

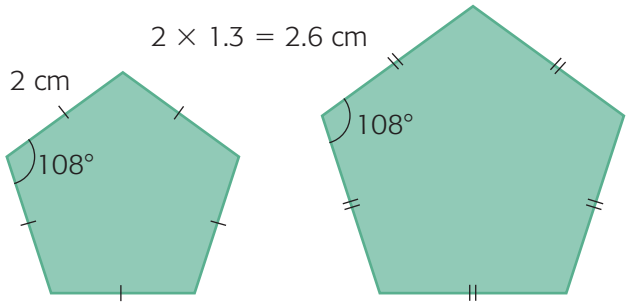
Study *Aid*

- See Lesson 3.4, Examples 1, 2, and 3.
- Try Chapter Review questions 4, 5, 6, 7, and 9.

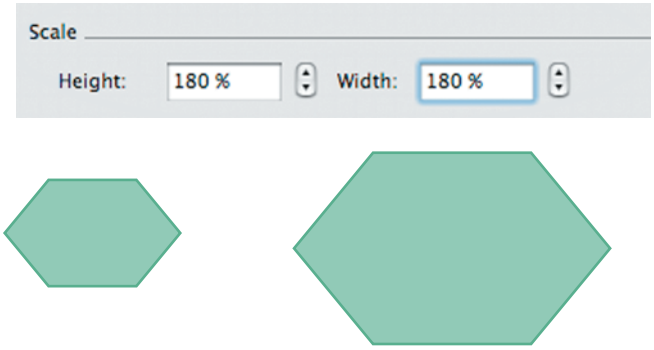
Q: How is the scale factor used to draw similar polygons?

A1: Each side length is multiplied by the scale factor. Each angle stays the same.

For example, to create a similar polygon using a scale factor of 1.3, multiply each side length by 1.3 and keep all angles the same.

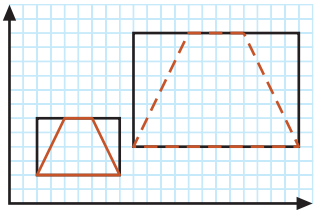


A2: Software packages allow you to use a scale factor to enlarge or reduce images or text boxes. Opening a dialog box reveals the scale for the length and width.



Enlarged by a scale factor of 180%

A3: A shape drawn on a grid can be enlarged or reduced to create a similar shape by drawing a reference rectangle around it, then enlarging or reducing the rectangle and drawing the similar shape inside it.



Scale factor: 2
Each dimension is doubled.

Q: How can a scale factor and properties of similar polygons help to solve problems?

A: Properties of similar polygons can be used to calculate unknown dimensions, to determine distances from scaled maps, charts, or diagrams, and to draw reductions or enlargements.

For example, to determine length *EF* in the second similar trapezoid, you would first identify two corresponding sides for which you have measures, in this case *AD* and *EH*.

You can use ratios and a proportion:

The ratio of *AD* to *EH* is $\frac{8}{24}$.

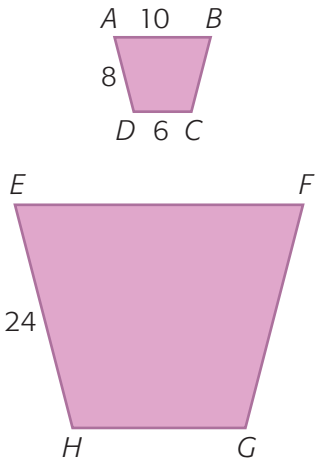
The ratio of *AB* to *EF* will be the same: $\frac{10}{\blacksquare}$.

A proportion can be created to show the relationship of the ratios:

$$\frac{8}{24} = \frac{10}{\blacksquare}$$
$$\frac{1}{3} = \frac{10}{\blacksquare}$$
$$30 = \blacksquare$$

Study Aid

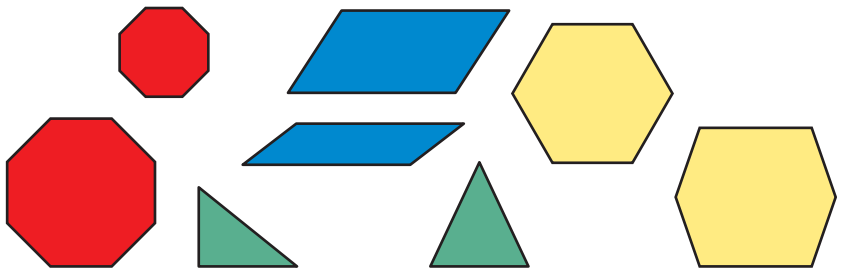
- See Lesson 3.4, Examples 1, 2, and 3; and Lesson 3.5, Examples 1, 2, and 3.
- Try Chapter Review questions 3, 4, 6, 7, 8, 9, and 10.



Practice

Lessons 3.1 and 3.2

1. Which polygons are similar? Explain how you know.



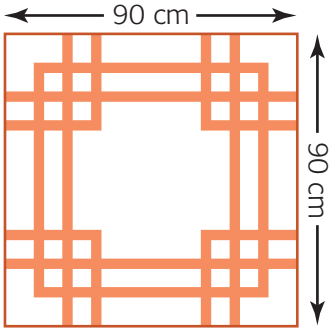
2. How can you verify that two polygons are similar?

Lesson 3.3

3. a) Triangle A is similar to triangle B. Triangle A has a base of 3.0 cm. Triangle B has a base of 7.5 cm. What is the scale factor?

b) Triangle A also has a side that measures 5 cm. How long is the corresponding side of triangle B?

c) Triangle A has a right angle. What is the measurement of the corresponding angle in triangle B?



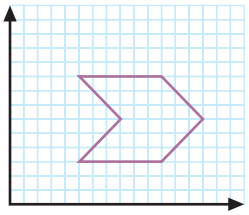
Lesson 3.4

4. Kenzu wants to enlarge this design to make a poster. He decides to enlarge it by 150%.

a) What will the poster dimensions be?

b) Draw the poster design from part a) on a single page at a size you choose. What scale factor did you use?

5. Draw a similar shape to the one at right using a scale factor of $\frac{1}{3}$.



Lesson 3.5

6. A photo that is 12.5 cm by 17.5 cm has been enlarged so that it is now twice as wide and similar to the original. What are the minimum dimensions for a frame that will fit the new enlarged photo?

7. A rectangular garden that is 2 m by 5 m will be enlarged by a scale factor of 5. How long will the fence be around the new garden?

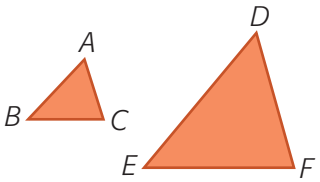
8. The organizing committee for an event is planning to sell T-shirts with a logo printed on the back and the front. The front logo fits inside a rectangle that is 8 cm by 5 cm. The back logo is an enlargement of the front logo by a scale factor of 3. Size small is 40 cm wide and size XL is 80 cm wide. Will the enlarged logo fit on the back of all T-shirt sizes?

9. A tree 12.8 m tall casts a shadow 35.5 m long. Yvonne is 1.7 m tall and she is standing nearby. How long is Yvonne's shadow?

10. Tim knows that the fire tower is 34 m tall. When he stands 1 m from a 2 m fence, the top of the fence and the top of the fire tower line up. Tim's eye level is 1.6 m above the ground. How far away is he from the fire tower?

Lesson 3.6

11. Explain step-by-step how you would show that these triangles are similar.



12. Daisy answered this problem: A billboard picture that is 4 m wide and 6 m long is to be scaled down for a poster that is 1 m wide. How long will the poster be?

a) Explain why Daisy's reasoning is not correct.

b) How would you communicate the correct solution?

Daisy

Solution

One metre is 3 m less than 4 m, so the length of the small poster should also be 3 m less than the length of the big poster. This means the small poster should be 6 − 3 = 3 m long.