Lesson 10.4 Warm Up

1. What is the area of a regular octagon that has an apothem of 14.5 cm and side length 12 cm?

2. What is the area of a kite that has diagonals 12 cm and 15 cm?

3. What is the area of a trapezoid with bases 10 in and 7 in and a height of 3 in?

Lesson 10.4 Perimeters & Areas of Similar Figures

A rectangle has dimensions of 4 ft by 7 ft. Choose a scale factor and write down the new dimensions of the rectangle. Then calculate the perimeter and area of the original and new rectangle to find their corresponding ratios.

	Scale Factor	Perimeter	Area	Ratio of Perimeters	Ratio of Areas
Original					
New					

### Theorem 10-7   Perimeters and Areas of Similar Figures

If the scale factor of two similar figures is $\frac{a}{b}$, then

(1) the ratio of their perimeters is $\frac{a}{b}$ and

(2) the ratio of their areas is $\frac{a^2}{b^2}$.

Ex. The trapezoids below are similar. The ratio of the lengths of corresponding sides is 6/9 or 2/3.

a. What is the ratio (smaller to larger) of the perimeters?

b. What is the ratio (smaller to larger) of the areas?

6 m

9 m
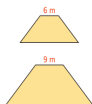
1 Two similar polygons have corresponding sides in the ratio 5:7. What is the ratio (larger to smaller) of their perimeters?

2 Two similar polygons have corresponding sides in the ratio 5:7. What is the ratio (larger to smaller) of their areas?

Ex. The area of the smaller regular pentagon is about 27.5 cm². What is the area of the larger regular pentagon?

4 cm   10 cm
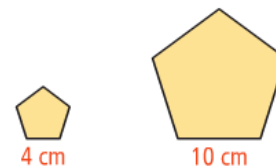
3 The scale factor of two similar parallelograms is 3/4. The area of the larger parallelogram is 96 square in. What is the area of the smaller parallelogram (do not include label)?

Ex. The scale factor of the dimensions of two similar pieces of window glass is 3:5. The smaller piece costs $2.50. How much should the larger piece cost?

Ex. The triangles below are similar. What is the scale factor? What is the ratio of their perimeters?

Area = 50 cm^2 Area = 98 cm^2
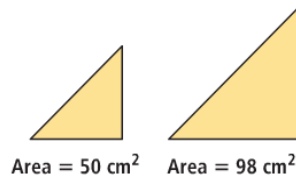
4 The areas of two similar rectangles are 1875 sq ft and 135 sq ft. What is the ratio of the perimeters (keep your answer in radical form)?