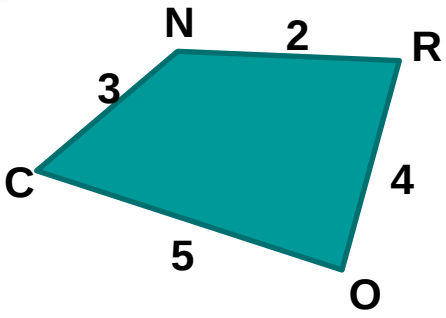
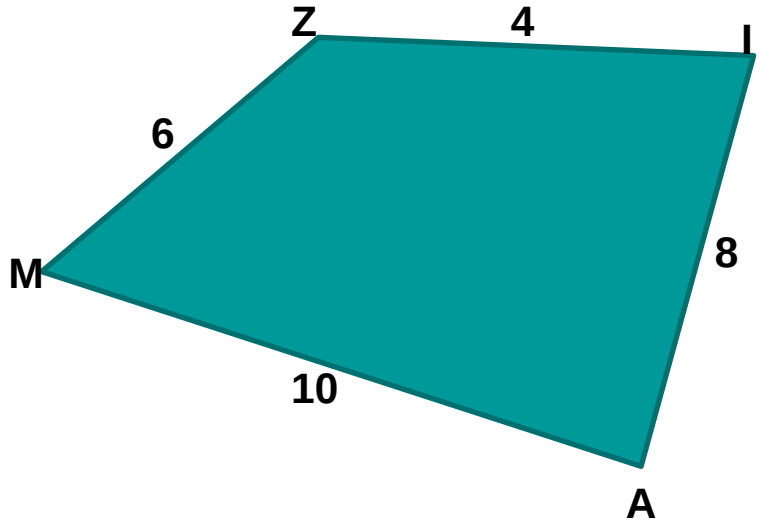
10.3

Areas of Similar Shapes

Similarity

CORN ~ MAIZ

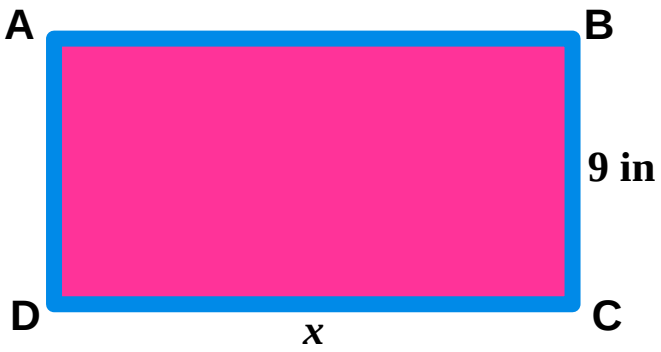


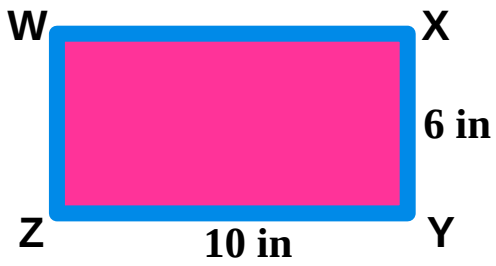


List 3 properties of similar shapes:

- **Same shape, different size**
- **Corresponding angles are congruent**
- **Corresponding sides are proportional**

FIND MISSING SIDES





$ABCD \sim WXYZ$

Squares Review

Squares that you should memorize

1^2

2^2

3^2

4^2

5^2

6^2

7^2

8^2

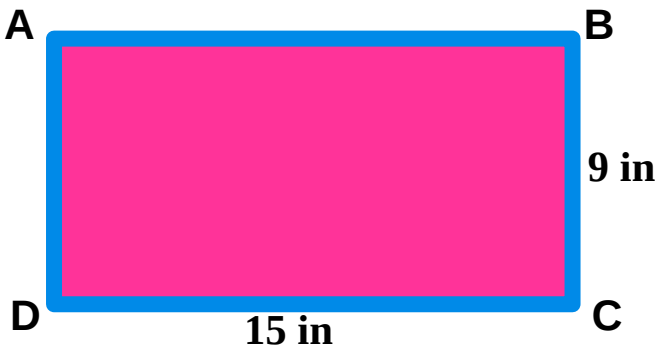
9^2

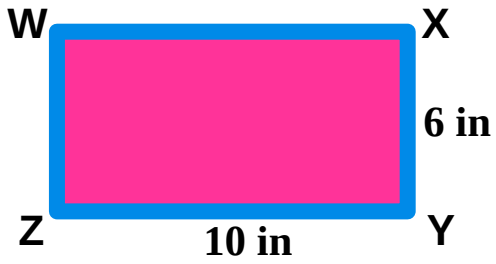
10^2

11^2

12^2

Connections: Sides and Perimeter





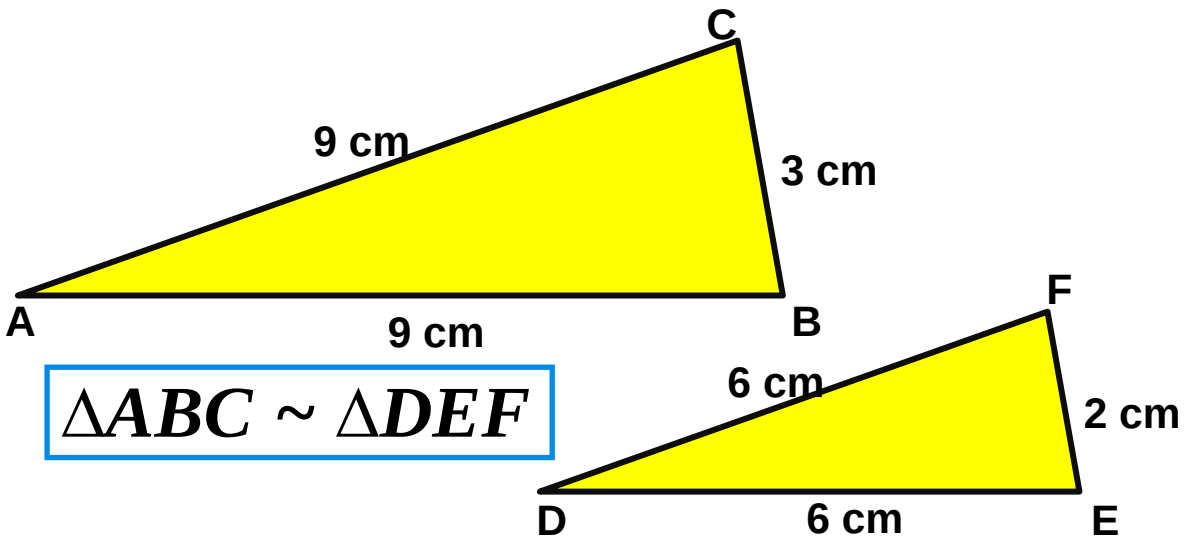
$ABCD \sim WXYZ$

Pick two corresponding sides (left to right). What is the ratio of the sides? Simplify if needed.

What is the ratio of the perimeters of both shapes (left to right)? Simplify if needed.

What do you notice about both of these answers?

Connections: Sides and Perimeter



$\Delta ABC \sim \Delta DEF$

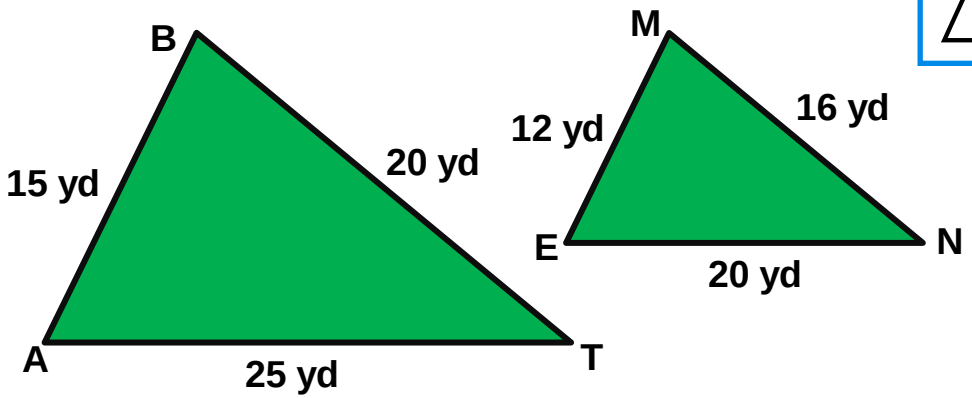
Pick two corresponding sides (left to right). What is the ratio of the sides? Simplify if needed.

What is the ratio of the perimeters of both shapes (left to right)? Simplify if needed.

What do you notice about both of these answers?

Connections: Sides and Perimeter

$\Delta BAT \sim \Delta MEN$

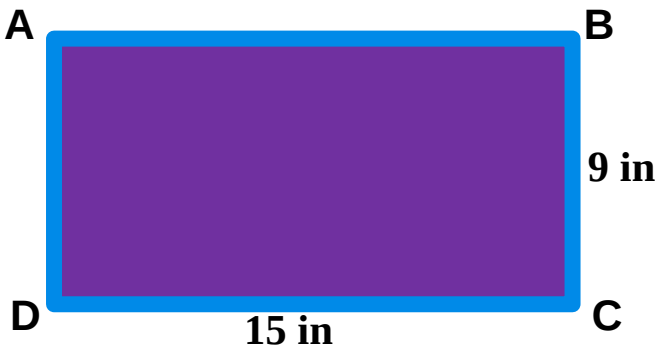


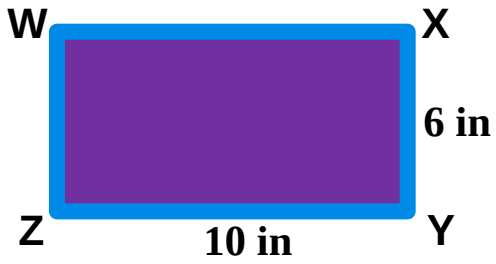
Pick two corresponding sides (left to right). What is the ratio of the sides? Simplify if needed.

What is the ratio of the perimeters of both shapes (left to right)? Simplify if needed.

What do you notice about both of these answers?

Connections: Sides and Area





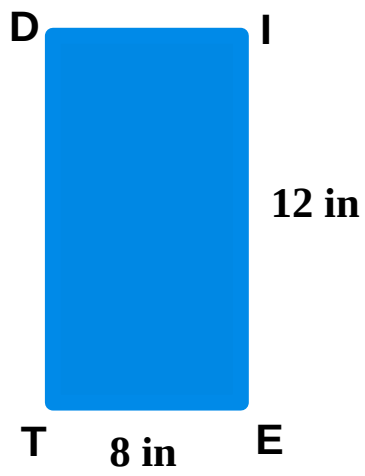
$ABCD \sim WXYZ$

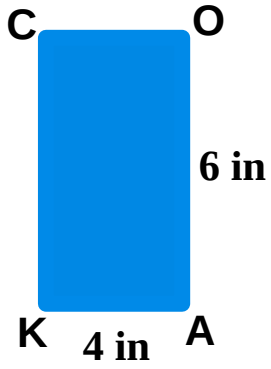
Pick two corresponding sides (left to right). What is the ratio of the sides? Simplify if needed.

What is the ratio of the areas of both shapes (left to right)? Simplify if needed.

What do you notice about both of these answers?

CONNECTIONS: SIDES AND AREA





DIET ~ COAK

Pick two corresponding sides (left to right). What is the ratio of the sides? Simplify if needed.

What is the ratio of the area of both shapes (left to right)? Simplify if needed.

What do you notice about both of these answers?

SUMMARY

2. 1.

The ratio of the perimeters of two shapes is

_____

_____ .

The ratio of the areas of two shapes is

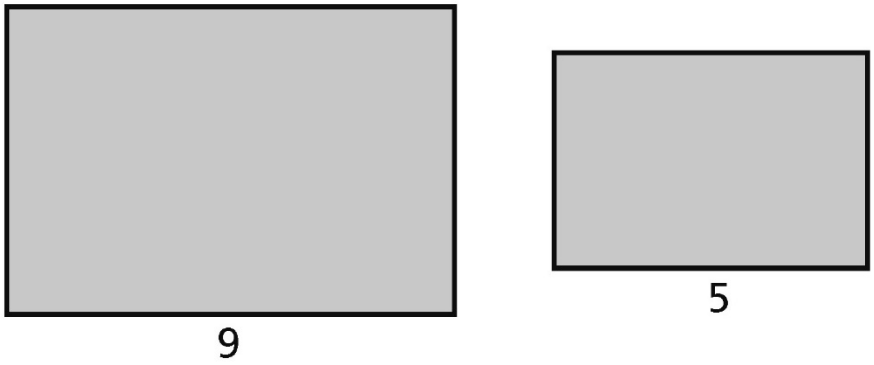
_____

_____ .

PRACTICE

The two figures are similar. Find the ratio (small to large) of the perimeters and of the areas.

1.



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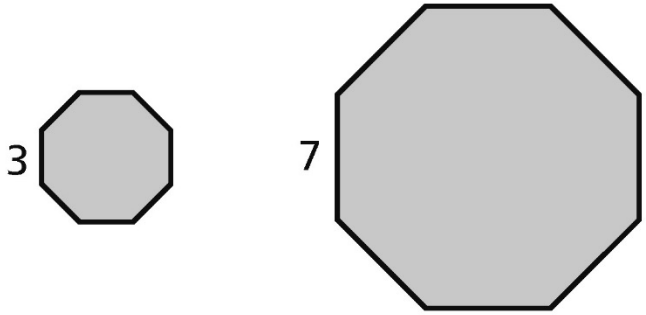

PRACTICE

3. How does doubling the side lengths of a triangle affect its area?

PRACTICE

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PRACTICE

4. The ratio of the corresponding side lengths of two similar rectangular tables is 4 : 5.

a. What is the ratio of the perimeters?

b. What is the ratio of the areas?

c. The perimeter of the larger table is 44 feet. What is the perimeter of the smaller table?

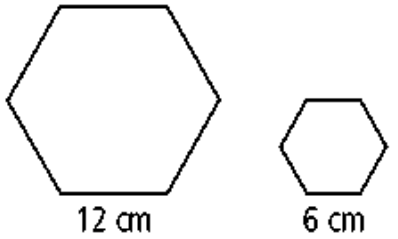
PRACTICE

5. The figures are similar. The ratio of the perimeters is 5 : 9. Find x.

Lesson Revisited:

Ratio of Sides	Ratio of Perimeters	Ratio of Areas

6) The hexagons at the right are similar. What is the ratio (smaller to larger) of their perimeters and their areas?

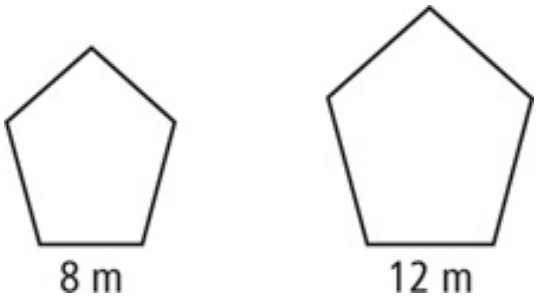


Ratio of Sides	Ratio of Perimeters	Ratio of Areas

Finding the missing perimeter:

The figures in each pair are similar. The perimeter of one figure is given.

7)



Perimeter of smaller pentagon = 40 m

Write a proportion:

Ratio of perimeters (using sides) **Ratio of ACTUAL perimeters**

$$\frac{\qquad}{\qquad} = \frac{\qquad}{\qquad}$$

Finding the missing perimeter:

The figures in each pair are similar. The perimeter of one figure is given.

8)

Write a proportion:

Ratio of perimeters (using sides) **Ratio of ACTUAL perimeters**

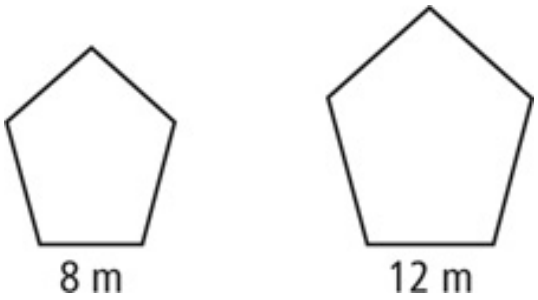
Perimeter of smaller rectangle = 12 in.

$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

Finding the missing area:

The figures in each pair are similar. The perimeter of one figure is given.

9)



Area of smaller pentagon = 80 m²

Write a proportion:

Ratio of areas (simplified) = **Ratio of ACTUAL areas**

$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

Finding the missing perimeter:

The figures in each pair are similar. The perimeter of one figure is given.

10)

Write a proportion:

Ratio of areas (simplified) = **Ratio of ACTUAL areas**

Area of smaller rectangle = 8 in^2

_____ = _____

Going further…

Ratio of Sides	Ratio of Perimeters	Ratio of Areas
$\frac{a}{b}$	$\frac{a}{b}$	$\frac{a^2}{b^2}$

13) The ratio of the areas of two rectangles is 49:36.

a) What is the ratio of the sides?

b) What is the ratio of the perimeters?

14) The ratio of the areas of two rectangles is 32:50.

a) What is the ratio of the sides?

b) What is the ratio of the perimeters?