

Lesson 2.6

Perimeter and Area of Similar Figures

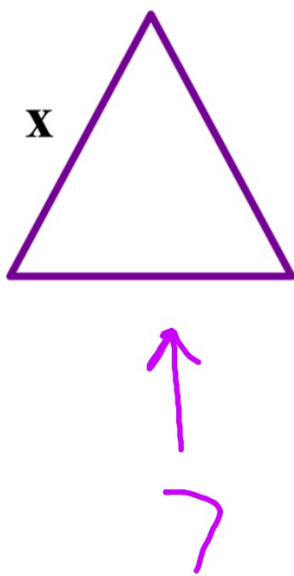
Learning Targets

- **Find Ratios of Perimeters**
- **Find Ratios of Areas**
- **Using Proportions to Find Perimeters and Areas**

Example: Other Ratio Formats

The figures are similar. Find x .

The ratio of the perimeters is $7:4$



$$\frac{7}{4} = \frac{70}{40} = \frac{42}{24}$$

Simplest form

Key Idea

Perimeters of Similar Figures

When two figures are similar, the ratio of their **Perimeters** is equal to the ratio of their corresponding **Side Lengths**.



Ratio of
Side lengths

$$\frac{15}{12} = \frac{5}{4}$$

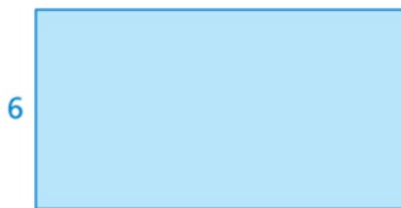
Ratio of
perimeters

$$\frac{5}{4}$$

Finding Ratios of Perimeters

Find the ratio (red to blue) of the perimeters of the similar rectangles.

$\frac{R}{B}$



Ratio of sides $\frac{4}{6} = \frac{2}{3}$

Ratio of Perimeters $\frac{2}{3}$

If the perimeter of the blue rectangle is 32 units, what is the perimeter of the red rectangle?

$$\frac{R}{B} = \frac{2}{3} = \frac{P}{32} \quad 3P = \frac{64}{3} \quad P = 21\frac{1}{3}$$

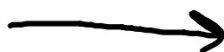
Key Idea

Areas of Similar Figures

When two figures are similar, the ratio of their **Areas** is equal to the **SQUARE** of the ratio of their corresponding **Side Lengths**.

Ratio of
Sides

$$\frac{9}{4}$$



Ratio of
Areas

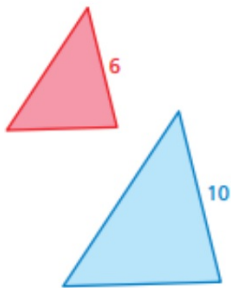
$$\left(\frac{9}{4}\right)^2 = \frac{81}{16}$$

Key Idea

Areas of Similar Figures

When two figures are similar, the ratio of their **Areas** is equal to the **SQUARE** of the ratio of their corresponding **Side Lengths**.

Find the ratio (red to blue) of the areas of the similar triangles.



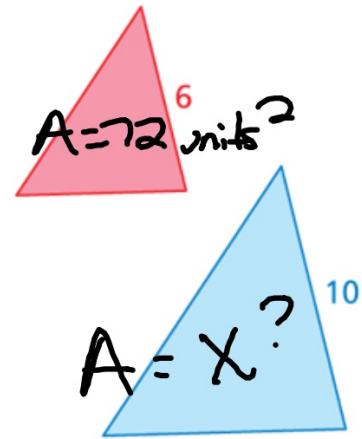
$$\frac{6}{10} = \left(\frac{3}{5}\right)^2 = \frac{9}{25}$$

Finding Ratios of Areas

Find the ratio (red to blue) of the areas of the similar triangles.

$$\frac{6}{10} = \left(\frac{3}{5}\right)^2 = \frac{9}{25}$$

$$\frac{B}{R} \quad \frac{9}{25} = \frac{72}{X} = \frac{9x}{9} = \frac{1800}{9}$$

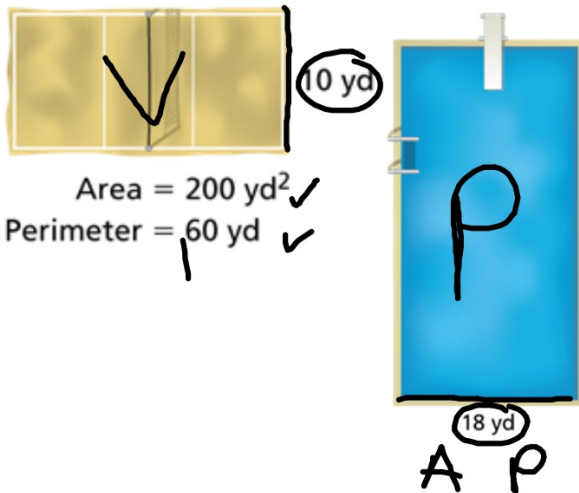


If the area of the red triangle is 72 units squared, what is the area of the blue triangle?

$$A = 200 \text{ units}^2$$

Use a Proportion to Find Perimeter

A swimming pool is similar in shape to a volleyball court. Find the perimeter P and the area A of the pool.



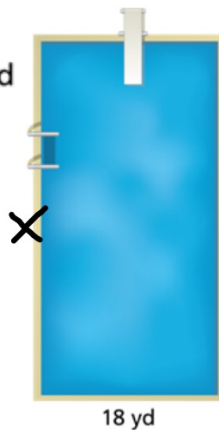
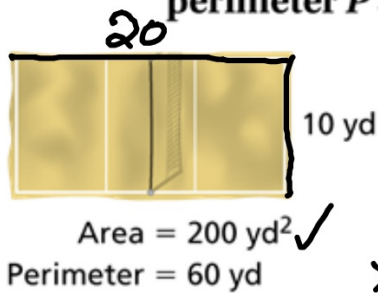
Perimeter

$$\frac{V}{P} = \frac{10}{18} = \frac{5}{9} \quad \text{Ratio of Perimeters}$$
$$\frac{V}{P} = \frac{5}{9} = \frac{60}{x}$$

$P = 108 \text{ yd}$

Use a Proportion to Find Area

A swimming pool is similar in shape to a volleyball court. Find the perimeter P and the area A of the pool.



Area

Ratio of Sides

$$\frac{5}{9}$$

Ratio of Areas

$$\left(\frac{5}{9}\right)^2 = \frac{25}{81}$$

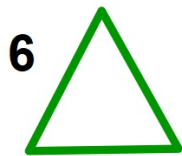
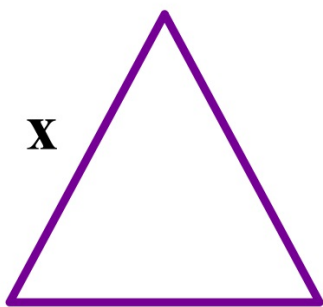
$$\frac{25}{81} = \frac{200}{X}$$

$$A = 648 \text{ yd}^2$$

Final Example: Other Ratio Formats

The figures are similar. Find x .

The ratio of the perimeters is 7:4



$$\frac{7}{4} = \frac{x}{6}$$

$$x = 10.5$$

Homework

Pg 80 & 81

#1-2, 4-12,

13, 15, 19