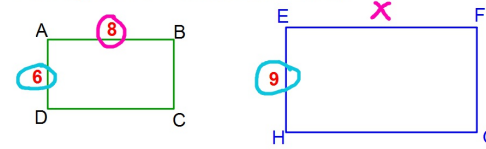## Panel 1

Thursday, April 16, 2020
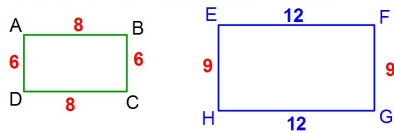
Sec 10-4   Perimeters and Areas of
                 Similar Figures.

Panel 2

Rectangles ABCD and EFGH are similar.

1. State the similarity ratio as a ratio of $\frac{Big}{Little}$ in reduced form. $\frac{9}{6} = \frac{3}{2}$

2. Find the length of EF. $\frac{3}{2} = \frac{X}{8}$ EF = 12

Panel 3

Rectangles ABCD and EFGH are similar.

3. Find the perimeter of each.   Perim of ABCD = 2(6)+2(8)=28
                                                      Perim of EFGH = 2(9)+2(12)=42

4. Write the ratio of the perimeters in the form $\frac{Big}{Little}$ in reduced form.

$\frac{42}{28} = \frac{3}{2}$ (GCF is 14)

5. What do you notice?
         The ratio of the Perimeters = Similarity Ratio

Panel 4

Rectangles ABCD and EFGH are similar.
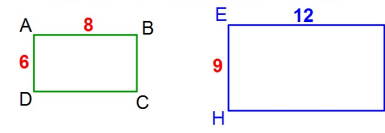
6. Find the area of each.   Area of ABCD = (6)(8)=48   Area of EFGH = (9)(12)=108

7. Write the ratio of the areas in the form $\frac{Big}{Little}$ in reduced form. $\frac{108}{48} = \frac{9}{4}$

8. How does this compare to the Similarity Ratio?
         $\frac{9}{4} = \frac{3^2}{2^2}$ The ratio of the Areas = square of the Similarity Ratio

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

If the similarity ratio 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 $\frac{a^2}{b^2}$

Given the Similarity Ratio of two similar figures is $\frac{5}{3}$

1. State the ratio of their Perimeters.

Ratio of Perimeters = Similarity Ratio   Ratio of Perimeters $= \dfrac{5}{3}$

2. State the ratio of their Areas.

Ratio of Areas = The square of the Similarity Ratio   Ratio of Areas $= \left(\dfrac{5}{3}\right)^2 = \dfrac{25}{9}$

Given the ratio of Perimeters of two similar figures is $\frac{7}{9}$

1. State the Similarity Ratio.

Similarity Ratio = Ratio of Perimeters   Similarity Ratio $= \dfrac{7}{9}$

2. State the ratio of their Areas.

Ratio of Areas = The square of the Similarity Ratio   Ratio of Areas $= \left(\dfrac{7}{9}\right)^2 = \dfrac{49}{81}$

Given the ratio of Areas two similar figures is $\frac{4}{49}$

1. State the Similarity Ratio.

If the ratio of the Areas is the square of the Similarity Ratio, then the Similarity Ratio is the square root of the ratio of the Areas.   Sim Ratio $= \sqrt{\dfrac{4}{49}} = \dfrac{2}{7}$
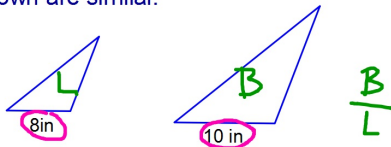
2. State the ratio of their Perimeters.

Ratio of Perim = Sim Ratio   Ratio of Perim $= \dfrac{2}{7}$

The two Δ's shown are similar.

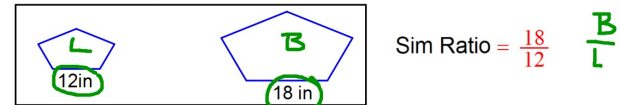The perimeter of the larger Δ is 30in. Find the perimeter of the smaller Δ.

Ratio of Perim = Sim Ratio ⟶ Sim Ratio = $\frac{10}{8}$

$$\frac{30}{x} = \frac{10}{8} \qquad \boxed{x = 24}$$
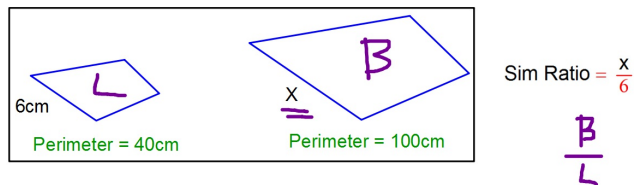

The two pentagons shown are similar.

12in   18 in   Sim Ratio = $\frac{18}{12}$ $\frac{B}{L}$

The area of the larger figure is 60in². Find the area of the smaller figure.

Ratio of Areas = $\left(\text{Sim Ratio}\right)^2 = \left(\frac{18}{12}\right)^2 = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$
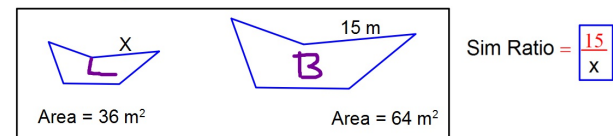
$$\frac{60}{x} = \frac{9}{4} \qquad \boxed{x = 26.67 \text{ in}^2}$$

The two figures shown are similar. Find the value of X.

6cm   X   Sim Ratio = $\frac{x}{6}$

Perimeter = 40cm   Perimeter = 100cm

$\frac{B}{L}$

Sim Ratio = Ratio of Perim $\frac{x}{6} = \frac{100}{40}$ $\boxed{x = 15}$

The two figures shown are similar. Find the value of X.

X   15 m   Sim Ratio = $\frac{15}{x}$

Area = 36 m²   Area = 64 m²

Sim Ratio = $\sqrt{\text{Ratio of Areas}}$ ⟶ $\frac{15}{x} = \sqrt{\frac{64}{36}}$ ⟶ $\frac{15}{x} = \frac{8}{6}$

$$\boxed{x = 11.25}$$

You can now do Practice #16 which is posted on my blog.