

Name _____

Date _____

Similar Polygons: Ratio of Perimeters & Areas - Guided Lesson

Explanation:

Explanation#1

Areas of two similar polygons are in the ratio 49:25, So the ratio of the corresponding sides 7:5.

Answer is: 7:5

Explanation#2

Area of triangle = $\frac{1}{2}$ x base x height

$$\Delta ABC = \frac{1}{2}(10)(12)$$

$$\Delta PQR = \frac{1}{2}(8)(10)$$

$$\Delta ABC = 60$$

$$\Delta PQR = 40$$

Now you can compare the ratio of the areas of these similar triangles.

Area ΔABC / Area ΔPQR

$$60/40$$

$$6/4$$

$$3/2$$

If two similar triangles have a scale factor of $a : b$, then the ratio of their areas is $a^2 : b^2$.



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Explanation#3

If we call the triangles $\Delta 1$ and $\Delta 2$, then

$$\frac{\text{perimeter triangle 1}}{\text{perimeter triangle 2}} = \frac{3}{6}$$

According to *Theorem 60*, this also means that the scale factor of these two similar triangles is 3 : 6.

Let $3x =$ a side in $\Delta 1$

And $6x =$ the corresponding side in $\Delta 2$

$$\text{Then, } \frac{\text{area triangle 1}}{\text{area triangle 2}} = \left(\frac{3x}{6x} \right)^2 \quad (\text{Theorem 61})$$

$$\frac{\text{area triangle 1}}{\text{area triangle 2}} = \frac{9x^2}{36x^2}$$

Step 3) Because the sum of the areas is 90 cm^2 , We get

$$\text{Area } \Delta 1 + \text{Area } \Delta 2 = 9x^2 + 36x^2$$

$$90 = 45x^2$$

$$2 = x^2$$

$$\text{Area } \Delta 1 = 9x^2$$

$$= 9(2)$$

$$= 18 \text{ cm}^2$$

$$\text{Area } \Delta 2 = 36x^2$$

$$= 36(2)$$

$$= 72 \text{ cm}^2$$

