

Unit 6: Similarity Review

Fill in the blanks with the correct information. Use your class notes to help!

- Name the three theorems that can be used to prove **similar** triangles: SAS, SSS, AA
- In a dilation, the scale factor, k , is the ratio of a side length in the Image to the corresponding side length in the pre-image.
- If $k > 1$, then the dilation is an enlargement.
- If $0 < k < 1$, then the dilation is a reduction.
- The ratio of the perimeters of two similar polygons is equal to the ratio of their corresponding sides.
- The ratio of the Areas of two similar polygons is equal to the **square** of the ratio of their corresponding sides.

Complete the practice problems below.

1. In a rectangle, the ratio of the width to the length is 4:5. If the rectangle is 40 centimeters long, find its width.

$$\frac{4}{5} = \frac{x}{40}$$

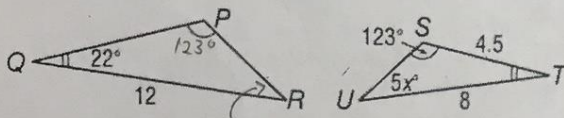
$$160 = 5x$$

$$x = \boxed{32 \text{ cm}}$$

2. Find the preimage given the vertices after a dilation centered at the origin with $k = 3$.
 $A'(12, 6), B'(18, 3), C'(15, 9)$

$$A(4, 2) \quad B(6, 1) \quad C(5, 3)$$

3. Given the similar figures, write a similarity statement. Then find the value of x .



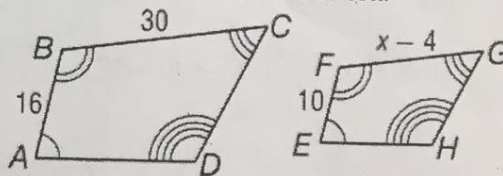
$$m\angle R = 180 - 22 - 123 = 35^\circ$$

$$35 = 5x$$

$$x = \boxed{7}$$

$$\boxed{\triangle QPR \sim \triangle TSU}$$

4. Given the similar figures, write a similarity statement. Then find the value of x .



$$\frac{16}{10} = \frac{30}{x-4}$$

$$16(x-4) = 300$$

$$16x - 64 = 300$$

$$16x = 364$$

$$x = \boxed{22.75}$$

$$\boxed{ABCD \sim EFGH}$$

5. Given the ratio of the angle measures in a triangle is 5:7:8, find the measure of each angle.

$$5x + 7x + 8x = 180$$

$$20x = 180$$

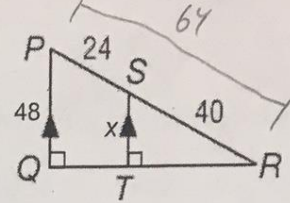
$$x = 9$$

$$5(9) = 45^\circ$$

$$7(9) = 63^\circ$$

$$8(9) = 72^\circ$$

6. Find the value of x in the diagram.



$$\frac{48}{64} = \frac{x}{40}$$

$$1920 = 64x$$

$$x = 30$$

7. The ratio of areas of two similar polygons is 64:81. If the perimeter of the smaller polygon is 112 cm. What is the perimeter of the larger polygon?

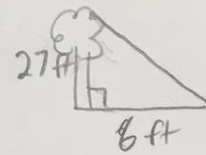
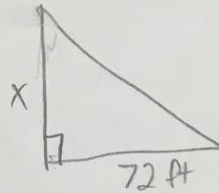
$$\frac{64}{81} \Rightarrow \frac{8}{9} \leftarrow \text{scale factor}$$

$$\frac{8}{9} = \frac{112}{x}$$

$$8x = 1008$$

$$x = 126 \text{ cm}$$

8. A cellular phone tower casts a shadow that is 72 feet long, while a nearby tree that is 27 feet tall casts a shadow that is 6 feet long. How tall is the tower?

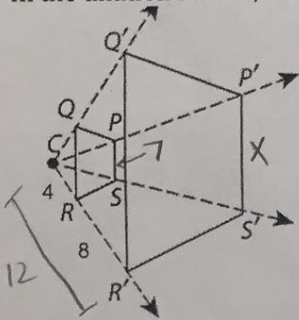


$$\frac{x}{27} = \frac{72}{6}$$

$$6x = 1944$$

$$x = 324 \text{ ft}$$

9. In the dilation shown, if $PS = 7$, find $P'S'$



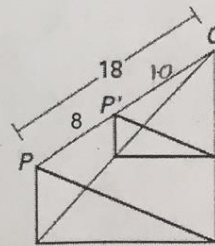
$$\frac{4}{12} = \frac{7}{x}$$

$$4x = 84$$

$$x = 21$$

$$P'S' = 21$$

10. Is the dilation shown an enlargement or reduction? What is the scale factor?



Reduction

$$k = \frac{10}{18} = \frac{5}{9}$$