

7 TAKS PREPARATION



TAKS Obj. 8
TEKS 8.10.A

REVIEWING PROPORTIONAL CHANGE PROBLEMS

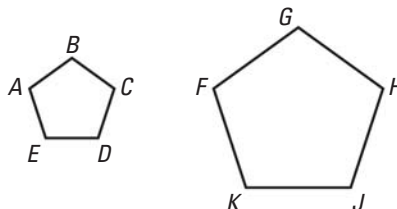
Some math problems require knowledge of how changing the dimensions of a two-dimensional figure proportionally affects the perimeter and area of the object.

When a figure is reduced or enlarged to create a new figure, the two figures are similar. The ratio of the lengths of two corresponding sides of similar figures is called the *scale factor*. If two figures are similar with a scale factor of $a : b$, then the following is true:

- The ratio of the perimeters of the figures is $a : b$.
- The ratio of the areas of the figures is $a^2 : b^2$.

EXAMPLE

The dimensions of pentagon $ABCDE$ are doubled to create pentagon $FGHJK$. The area of $ABCDE$ is 15 square feet. Find the area of $FGHJK$.



Solution

STEP 1 Find the scale factor. Let x be the length of a side of $ABCDE$. Then $2x$ is the length of the corresponding side of $FGHJK$. The ratio of the lengths of these sides is $\frac{x}{2x} = \frac{1}{2}$, or $1 : 2$.

STEP 2 Write and solve a proportion to find the area y of $FGHJK$.

$$\frac{1^2}{2^2} = \frac{15}{y} \quad \text{Write proportion.}$$

$$\frac{1}{4} = \frac{15}{y} \quad \text{Simplify.}$$

$$1 \cdot y = 4 \cdot 15 \quad \text{Cross products property}$$

$$y = 60 \quad \text{Simplify.}$$

► The area of $FGHJK$ is 60 square feet.

CHECK Check that your answer is reasonable. Pentagon $FGHJK$ is larger than $ABCDE$, so it should have a greater area. Since $60 > 15$, the answer is reasonable.