

PROPORTIONAL CHANGE PROBLEMS ON TAKS

Below are examples of proportional change problems in multiple choice format. Try solving the problems before looking at the solutions. (Cover the solutions with a piece of paper.) Then check your solutions against the ones given.

1. Describe the effect on the area of a circle when the radius is halved.

A The area remains constant.
B The area is squared.
C The area is 25% of the original area.
D The area is halved.

Solution

The scale factor of the original circle to the new circle is $1 : \frac{1}{2}$. The ratio of the areas is $1^2 : \left(\frac{1}{2}\right)^2$, or $1 : \frac{1}{4}$. So, the area is $\frac{1}{4}$, or 25%, of the original. The correct answer is C.

(A) **(B)** **(C)** **(D)**

2. The dimensions of a hexagon are doubled to create a larger hexagon. The perimeter of the smaller hexagon is 30 centimeters. What is the perimeter of the larger hexagon?

F 15 cm
G 60 cm
H 150 cm
J 180 cm

Solution

The scale factor of the smaller hexagon to the larger one is $1 : 2$. Let x be the perimeter of the larger hexagon.

$$\frac{1}{2} = \frac{30}{x}$$

$$1 \cdot x = 2 \cdot 30$$

$$x = 60$$

The correct answer is G.

(F) **(G)** **(H)** **(J)**

3. A rectangular photograph is enlarged so that its dimensions are 3 times as wide and 3 times as long as the original size. The area of the enlarged photograph is 135 square inches. What was the area of the original photograph?

A 9 in.²
B 15 in.²
C 27 in.²
D 45 in.²

Solution

The scale factor of the original photograph to the enlarged photograph is $1 : 3$. Let x be the area of the original photograph.

$$\frac{1^2}{3^2} = \frac{x}{135}$$

$$1^2 \cdot 135 = 3^2 \cdot x$$

$$135 = 9x$$

$$15 = x$$

The area of the original photograph is 15 in.², so the correct answer is B.

(A) **(B)** **(C)** **(D)**