

**LESSON**  
**9-5**

**Reteach**

**Effects of Changing Dimensions Proportionally**

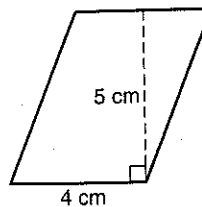
What happens to the area of the parallelogram if the base is tripled?

original dimensions:

$$\begin{aligned} A &= bh \\ &= 4(5) \\ &= 20 \text{ cm}^2 \end{aligned}$$

triple the base:

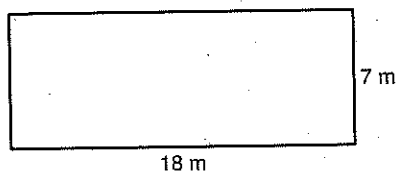
$$\begin{aligned} A &= bh \\ &= 12(5) \\ &= 60 \text{ cm}^2 \end{aligned}$$



Notice that  $60 = 3(20)$ . If the base is multiplied by 3, the area is also multiplied by 3.

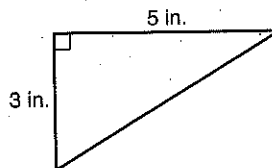
Describe the effect of each change on the area of the given figure.

1. The length of the rectangle is doubled.



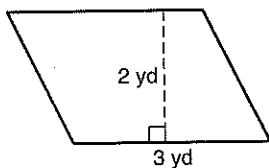
\_\_\_\_\_

2. The base of the triangle is multiplied by 4.



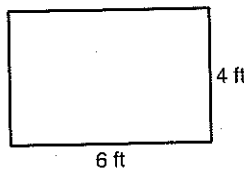
\_\_\_\_\_

3. The height of the parallelogram is multiplied by 5.



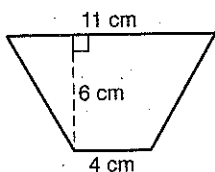
\_\_\_\_\_

4. The width of the rectangle is multiplied by  $\frac{1}{2}$ .



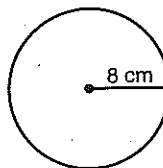
\_\_\_\_\_

5. The height of the trapezoid is multiplied by 3.



\_\_\_\_\_

6. The radius of the circle is multiplied by  $\frac{1}{2}$ .



\_\_\_\_\_

**LESSON 9-5 Reteach**  
**9-5 Effects of Changing Dimensions Proportionally** continued

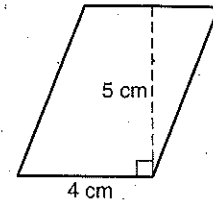
What happens if both the base and height of the parallelogram are tripled?

original dimensions:

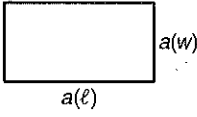
$$\begin{aligned} A &= bh \\ &= 4(5) \\ &= 20 \text{ cm}^2 \end{aligned}$$

triple the base and height:

$$\begin{aligned} A &= bh \\ &= 12(15) \\ &= 180 \text{ cm}^2 \end{aligned}$$

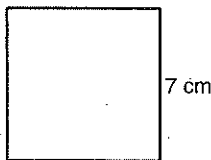


When just the base is multiplied by 3, the area is also multiplied by 3. When both the base and height are multiplied by 3, the area is multiplied by  $3^2$ , or 9.

Effects of Changing Dimensions Proportionally		
Change in Dimensions	Perimeter or Circumference	Area
Consider a rectangle whose length $\ell$ and width $w$ are each multiplied by $a$ . 	The perimeter changes by a factor of $a$ . $P = 2\ell + 2w$ new perimeter: $P = a(2\ell + 2w)$	The area changes by a factor of $a^2$ . original area: $A = \ell w$ new area: $A = a^2(\ell w)$

Describe the effect of each change on the perimeter or circumference and the area of the given figure.

7. The side length of the square is multiplied by 6.

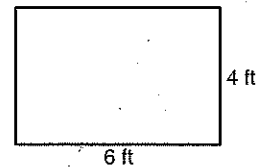


\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. The base and height of the rectangle are both multiplied by  $\frac{1}{2}$ .



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. The base and height of a triangle with base 7 in. and height 3 in. are both doubled.

10. A circle has radius 5 mm. The radius is multiplied by 4.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_