

2.4 Practice Problems

Write a general formula to describe each variation. Use these directions for 1-3.

1. y varies directly with x ; $y=15$ when $x=10$

$$y = kx$$

$$\frac{15}{10} = \frac{k(10)}{10}$$

$$\frac{3}{2} = k$$

$$y = \frac{3}{2}x$$

2. y varies inversely with x ; $y=2$ when $x=10$

$$y = \frac{k}{x}$$

$$y = \frac{20}{x}$$

$$10, 2 = \frac{k}{10} \cdot 10$$

$$20 = k$$

3. y varies jointly with x and z ; $y=42$ when $x=2$ and $z=7$

$$y = kxz$$

$$42 = k(2)(7)$$

$$42 = 14k$$

$$\frac{42}{14} = \frac{14k}{14}$$

$$3 = k$$

$$y = 3xz$$

4. The perimeter of a square varies directly with the length of its side. If a square with a perimeter of 20 inches has a side of length 5 inches find a formula that relates the perimeter of a square to the length of the side. Then find the perimeter of a square that has a side of 9 inches.

P = perimeter

s = side

$$P = ks$$

$$\frac{20}{5} = \frac{k(5)}{5}$$

$$4 = k$$

$$\boxed{P = 4s}$$

$$P = 4(9) = 36 \text{ inches}$$

5. The volume of a right circular cylinder varies jointly with the square of its radius and its height. If a right circular cylinder has a volume of $45\pi \text{ cm}^3$ with a radius of 3 cm and height of 5 cm find the formula that relates the volume of a right circular cylinder to the radius and height.

V - volume

r - radius

h - height

$$V = kr^2h$$

$$45\pi = k(3)^2(5)$$

$$\frac{45\pi}{45} = \frac{45k}{45}$$

$$\pi = k$$

$$V = \pi r^2 h$$