

Lesson 13-5

Example 1

What is the equation for a direct variation when one pair of values is $x = 10$ and $y = 8$?

Solution

$$y = kx \quad \text{Substitute in the equation for direct variation.}$$

$$8 = k(10)$$

$$\frac{8}{10} = k$$

$$0.8 = k \quad \text{Solve for } k.$$

The equation is $y = 0.8x$.

Example 2

FOOD PRICES The cost of apples varies directly with weight. If 9 lb of apples cost \$3.60, how much will 21 lb of apples cost?

Solution

$$y = kx$$
$$3.60 = k(9) \quad \text{Substitute.}$$

$$\frac{3.60}{9} = k$$

$$0.4 = k \quad \text{Solve for } k.$$

$$y = 0.4x \quad \text{Write the equation.}$$

$$y = 0.4(21) \quad \text{Substitute } x = 21.$$

$$y = 8.4 \quad \text{Solve.}$$

Twenty-one pounds of apples will cost \$8.40

Example 3

SPACE EXPLORATION An air filter used in a space vehicle is in the shape of a cube. The surface area of a cube varies directly as the square of its sides. If the surface area of the air filter with sides 11 in. long is 726 in^2 , what is the surface area of an air filter in the shape of a cube with sides 9 in. long?

Solution

$$\begin{aligned}y &= kx^2 \\726 &= k(11)^2 && \text{Substitute in the equation.} \\726 &= 121k && \text{Solve for } k. \\ \frac{726}{121} &= k \\6 &= k \\y &= 6x^2 && \text{Write the equation.} \\y &= 6(9)^2 && \text{Substitute 9 for } x. \\y &= 486 && \text{Solve.}\end{aligned}$$

The surface area of a cube with sides 9 in. is 486 in^2 .