



Objective 3 TEKS A.6.G Review

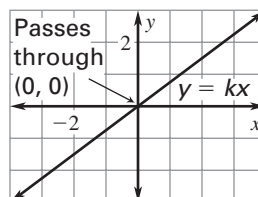
A.6.G Relate direct variation to linear functions and solve problems involving proportional change.

A **direct variation** is a linear function that can be written in the form $y = kx$, where $k \neq 0$. The slope k of a direct variation equation is called the **constant of variation**.

In a direct variation equation, **y varies directly with x** or **y is directly proportional to x** .

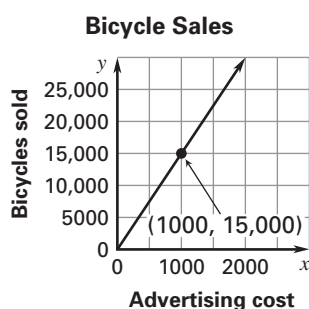
The graph of a direct variation equation passes through the origin.

If k is unknown, you can use a proportion to solve some direct variation problems.



EXAMPLE

The graph shows a direct variation between a bicycle manufacturer's monthly advertising costs and the number of bicycles sold each month. What is the constant of variation? How many bicycles are sold when the advertising costs are \$1500?



Find the slope of the line.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{15,000 - 0}{1000 - 0} = 15$$

The slope of the line is 15, so the constant of variation is 15.

The direct variation equation is $y = 15x$.

If $x = 1500$, then $y = 15(1500)$, or 22,500.

The manufacturer sells 22,500 bicycles when the advertising costs are \$1500.

YOU DO IT

The maximum weight you can lift with a lever varies directly with the amount of force you apply. Conner can lift an 80 pound weight by applying 32 pounds of force to a certain lever. How much force x will he have to apply to lift 120 pounds with the same lever? What direct variation equation represents this relationship?

You can find x by solving the proportion $\frac{80}{32} = \frac{120}{x}$.

What is the value of x ? $x = 48$

How much force will Conner have to apply to lift 120 pounds with the lever?

48 pounds

What is the value of k if $80 = 32k$? $k = 2.5$

What direct variation equation represents the relationship between the maximum weight y Conner can lift with the lever and the force x he applies to the lever?

$y = 2.5k$