



Algebra 1

Chapter 5
Section 5-2

Vocabulary

Direct
Variation

A relationship that can be represented by the equation $y=kx$

Constant of
Variation

Constant k that is the coefficient of x . $k = y/x$

Identifying Direct Variation

Are the following relationships direct variations?

$$2y = 12x$$

$$7y = 3x$$

$$14y = x$$

$$y = 2x + 17$$

When $x = 3$, $y = 12$
and
when $x = 5$, $y = 20$
and
when $x = 1$, $y = 3$

Yes
Yes
No

Yes
Yes for the first two (No for all three)

Using Direct Variation

Suppose y varies directly with x and $y = 12$ when $x = 5$.
Write an equation that describes the direct variation.

When $x = 11$, what is the value of y ?

$$\begin{aligned}y &= kx \\12 &= 5k \\12/5 &= k \\k &= 2.4 \\y &= 2.4x\end{aligned}$$

$$\begin{aligned}y &= 2.4(11) \\y &= 26.4\end{aligned}$$

Using Direct Variation

6 gallons of gas costs \$18.00, 5 gallons costs \$15.00, and 4 gallons costs \$12.00. Is the relationship a direct variation?

How much does one gallon of gas cost?

How much would twelve gallons cost?

Yes

1 Gallon costs \$3.00

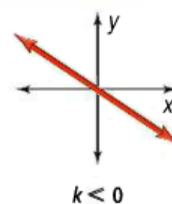
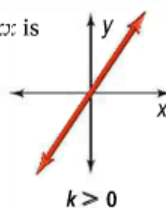
\$36.00

Direct Variation

Concept Summary Graphs of Direct Variations

The graph of a direct variation equation $y = kx$ is a line with the following properties.

- The line passes through $(0, 0)$.
- The slope of the line is k .



Graphing a Direct Variation

x	4	8	10
y	6	12	15

$$y = kx$$

$$y = 1.5x$$

$$k = 1.5$$

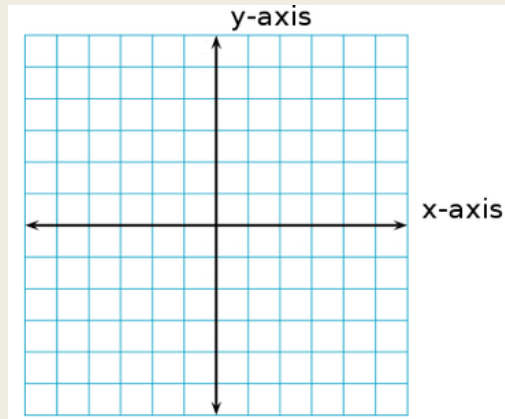
OR

$$y = \left(\frac{3}{2}\right)x$$

$$1.5(8) = 12$$

$$1.5(10) = 15$$

Is the relationship a direct variation?



Graphing a Direct Variation

x	-2	1	4
y	4	-2	-8

Is the relationship a direct variation?

$$y = kx$$

$$4 = k(-2)$$

$$y = -2x$$

$$-2(1) = -2$$

$$-2(4) = -8$$

