

Algebra 1

3.4

$$y = k \cdot x$$

Write and graph direct variation equations

Solve direct variation problems

y-intercept $(0,0)$

$$y = \frac{1}{2} x$$

$k =$ slope m

direct variation

constant of variation (proportionality) k

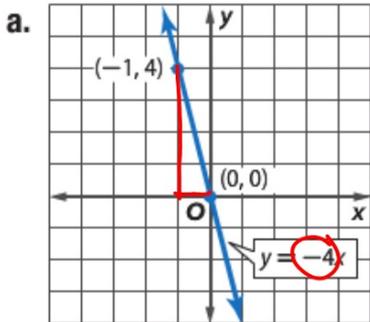
whiteboards

COV comes
from equation
Slope from
ordered pairs

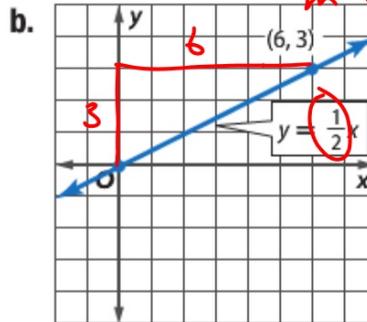


Example 1 Slope and Constant of Variation

Name the constant of variation for each equation. Then find the slope of the line that passes through each pair of points.



COV = -4
 $m = \frac{-4}{1}$

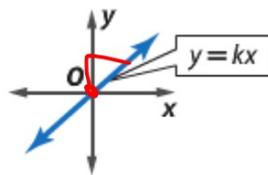


COV = $\frac{1}{2}$
 $m = \frac{1}{2}$

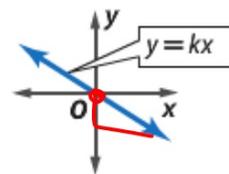


ConceptSummary Direct Variation Graphs

- Direct variation equations are of the form $y = kx$, where $k \neq 0$.
- The graph of $y = kx$ always passes through the origin.
- The slope is positive if $k > 0$.



- The slope is negative if $k < 0$.

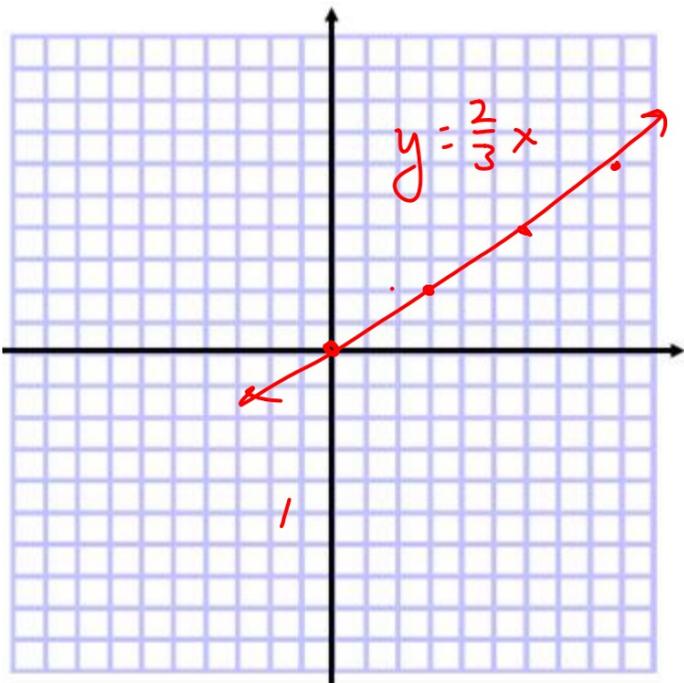


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2A. $y = 6x$

$m = \frac{6}{1}$

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



$$2C. y = \frac{-5x}{1}$$

$$2D. y = \frac{-3}{4}x$$

$$\boxed{\frac{-3}{4}}$$

$$\frac{3}{-4}$$

~~$$\frac{-3}{-4}$$~~

$y = k \cdot x$
31. If $y = 15$ when $x = \frac{3}{4}$, find x when $y = 25$.

$$\begin{pmatrix} \frac{3}{4} & , & 15 \\ x & & y \end{pmatrix}$$

$$y = k \cdot x$$
$$\frac{15}{\frac{3}{4}} = \frac{k \cdot \frac{3}{4}}{\frac{3}{4}}$$
$$20 = k$$

$$y = 20x$$
$$\frac{25}{20} = \frac{20x}{20}$$
$$\frac{5}{4} = x$$

32. If $y = 4.5$ when $x = 2.5$, find y when $x = 12$.

$$(2.5, 4.5)$$

$$y = 1.8x$$

$$y = k \cdot x$$
$$\frac{4.5}{2.5} = \frac{k \cdot 2.5}{2.5}$$

$$1.8 = k$$

$$y = 1.8(12)$$

$$y = 21.6$$

There are other kinds of variation:

inverse
combined

