3-4 Direct Variation

$y = kx$ constant rate of change (linear)

$k \neq 0$

k = constant of variation (Slope) constant of proportionality

The graph of $y = kx$ always passes through the origin.

$k > 0$ slope is positive

$k < 0$ slope is negative

$y = \frac{1}{4}x$

$(0,0)\ (4,1)$

$\frac{1}{4}$ constant of variation

$m = \frac{y_2 - y_1}{x_2 - x_1}$

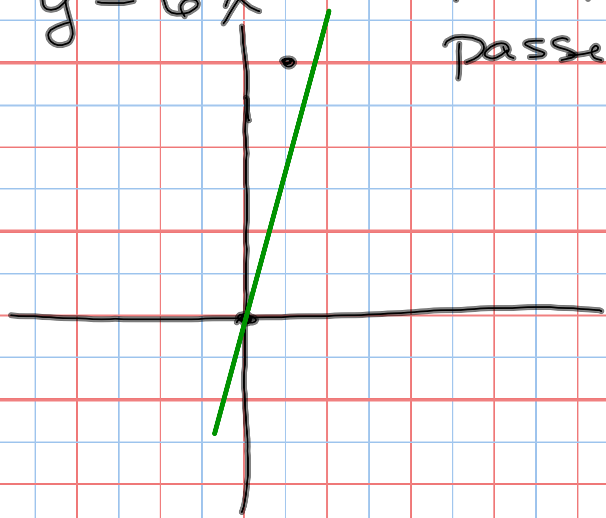
$m = \frac{1-0}{4-0} = \frac{1}{4}$

$y = 6x$

$m = 6$

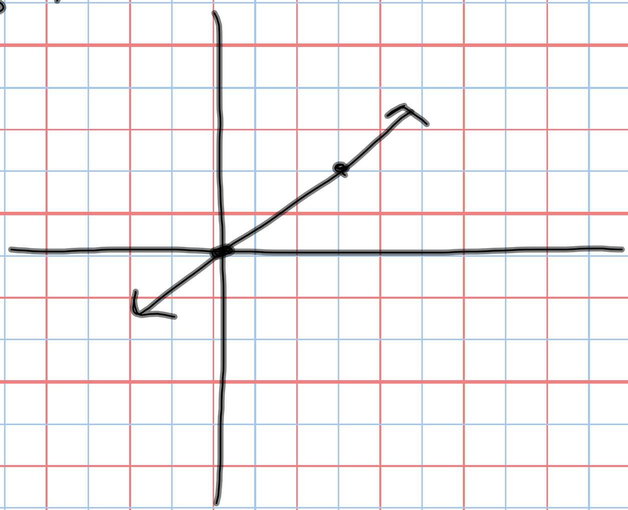
passes through $(0,0)$

$\frac{6}{1}$



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

$\frac{2 \text{ rise} \uparrow}{3 \text{ run} \rightarrow}$



$y = kx$

$\frac{72}{8} = \frac{k(8)}{8}$

D	U
$\cdot 8$	$\div 8$

a.) $9 = k$

b.) $\frac{63}{9} = \frac{9}{9}x$

$7 = x$

Slope should always be reported with the proper units:

$$\frac{\text{dependent variable (units)}}{\text{Independent variable (units)}}$$

To intrepret the slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

The slope of $\boxed{\#}$ represents the ratio (proportion) of the change in the $\boxed{\text{depedent variable}}$ y axis to the change in the $\boxed{\text{independent variable}}$ x axis

1.) $\frac{21-14}{2-1} = \frac{\$7}{1 \text{ miles}}$

2.) $(0,200)$ $(10,300)$

$\frac{300-200}{10-0} = \frac{100}{10} = \frac{\$10}{1 \text{ years}}$

3.)