





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



A line passes through the points $(2, k)$ and $(5, 7)$.
 If the slope is $\frac{2}{3}$, what is the value of k?

$m = \frac{2}{3}$

Given: $x_1 = 2$ $x_2 = 5$
 $y_1 = k$ $y_2 = 7$
 $m = \frac{2}{3}$

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

$$\frac{2}{3} = \frac{7 - k}{5 - 2}$$

$$\cancel{3} \cdot \frac{2}{\cancel{3}} = \frac{7 - k}{\cancel{3}} \cdot \cancel{3}$$

$$2 = 7 - k$$

$$k = 7 - 2$$

$$k = 5$$

$$\frac{2}{3} = \frac{7 - k}{3}$$

(cross multiply)

$$2(3) = 3(7 - k)$$

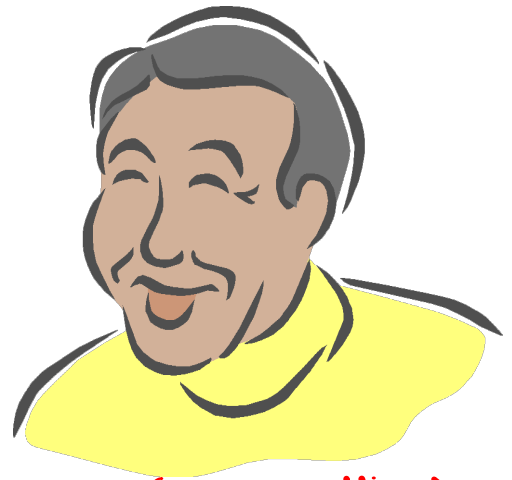
$$6 = 21 - 3k$$

$$3k = 21 - 6$$

$$\frac{3k}{3} = \frac{15}{3}$$

$$k = 5$$

Same answer



A line passes through the points $(-7, -8)$ and $(k, -4)$.
 If the slope is $\frac{-4}{3}$, what is the value of k?

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

$$\frac{-4}{3} = \frac{-4 - (-8)}{k - (-7)}$$

$$\frac{-4}{3} = \frac{4}{k+7} \quad (\text{cross multiply})$$

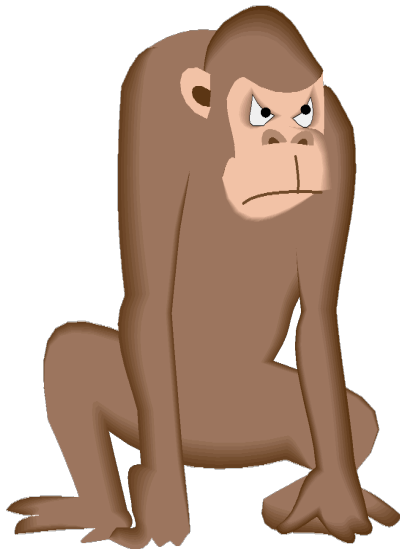
$$-4(k+7) = 4(3)$$

$$-4k - 28 = 12$$

$$-4k = 12 + 28$$

$$\frac{-4k}{-4} = \frac{40}{-4}$$

$$k = -10$$



A line passes through the points $(2, k)$ and $(k, -3)$.
 If the slope is -2 , what is the value of k ?

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

$$\frac{-2}{1} = \frac{-3 - k}{k - 2}$$

(cross multiply)

$$-2(k - 2) = 1(-3 - k)$$

$$-2k + 4 = -3 - k$$

$$-2k + k = -3 - 4$$

$$\frac{-1k}{-1} = \frac{-7}{-1}$$

$$k = 7$$





A line passes through the points (x_1, y_1) and (x_2, y_2) .
 If the slope is $\frac{3}{5}$, what is the value of k ?

$(10, 11)$ and $(5, 8)$

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

$$\frac{3}{5} = \frac{k+3-11}{k-2k}$$

$$\frac{3}{5} = \frac{k-8}{-k}$$

(Cross multiply)

$$3(-k) = 5(k-8)$$

$$-3k = 5k - 40$$

$$-3k - 5k = -40$$

$$\frac{-8k}{-8} = \frac{-40}{-8}$$

$$k = 5$$

Homework

⑥ (x_1, y_1) and (x_2, y_2) $m = -\frac{1}{3}$, Find k
 $(1, 2k)$ and $(-\frac{1}{3}k, 2)$ slope = $-\frac{1}{3}$, Find k

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

$$-\frac{1}{3} = \frac{2 - 2k}{-\frac{1}{3}k - 1} \quad (\text{cross multiply})$$

$$-1 \left(-\frac{1}{3}k - 1 \right) = 3(2 - 2k)$$

$$\frac{1}{3}k + 1 = 6 - 6k$$

$$\frac{1}{3}k + \frac{6k}{1} = 6 - 1$$

$$\frac{1k}{3} + \frac{18k}{3} = 5$$

$$\frac{19k}{3} = 5 \cdot 3$$

$$\frac{19k}{19} = \frac{15}{19}$$

$$k = \frac{15}{19}$$

If slope:

undefined = $\frac{1}{0}$ (vertical line) y-axis

$\frac{0}{1}$ (horizontal line) x-axis

⑦ $m = \frac{y_2 - y_1}{x_2 - x_1}$

$\frac{1}{0} = \frac{4 - 2k}{-3k - 1}$

$1(-3k - 1) = 0(4 - 2k)$

$-3k - 1 = 0 - 0$

$-3k - 1 = 0$

$\frac{-3k}{-3} = \frac{1}{-3}$

$k = -\frac{1}{3}$