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

A line passes through the points (2, k) and (5,7).
If the slope is 2 , what is the value of k?

(x_1, y_1) (x_2, y_2)

$\dfrac{2}{3}$

m

Given: $x_1 = 2$ $x_2 = 5$
         $y_1 = k$ $y_2 = 7$

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

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

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

$3 \cdot \dfrac{2}{3} = \dfrac{7 - k}{3} \cdot 3$

$2 = 7 - k$

$k = 7 - 2$

$\boxed{k = 5}$

$\dfrac{2}{3} = \dfrac{7 - k}{3}$ (cross multiply)

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

$6 = 21 - 3k$

$3k = 21 - 6$

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

$\boxed{k = 5}$

Same answer

A line passes through the points (x_1, y_1) $(-7,-8)$ and (x_2, y_2) $(k,-4)$.
If the slope is $\underset{m}{\underline{\underline{}}}$ $\dfrac{-4}{3}$, what is the value of k?

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

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

$$\frac{-4}{3} \,\,\rlap{$\times$}\,\, \frac{4}{k+7} \qquad \text{(cross multiply)}$$

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

$$-4k \,\boxed{-28} = 12$$

$$-4k = 12 + 28$$

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

$$\boxed{k = -10}$$

(x_1, y_1) (x_2, y_2)
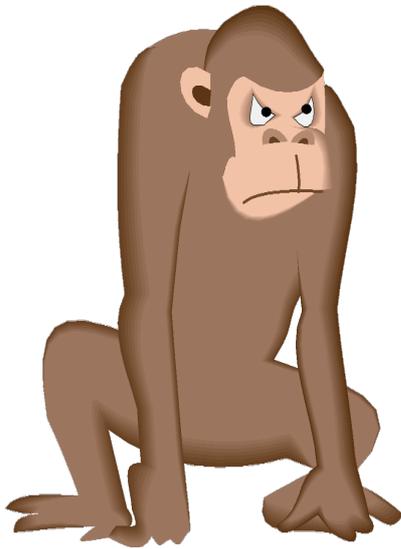
A line passes through the points (2, k) and (k,-3).
If the slope is -2 , what is the value of k?

m

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

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

(cross multiply)

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

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

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

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

$$\boxed{k = 7}$$

A line passes through the points (2k , 11) and (k , k+3).
If the slope is $\dfrac{3}{5}$, what is the value of k?