

"Finding K"



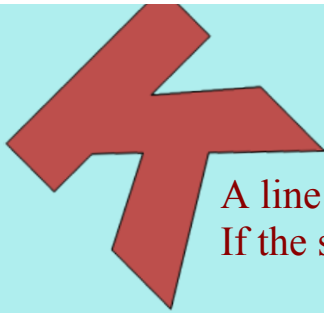
value "k" in one or both of the co-ordinates.



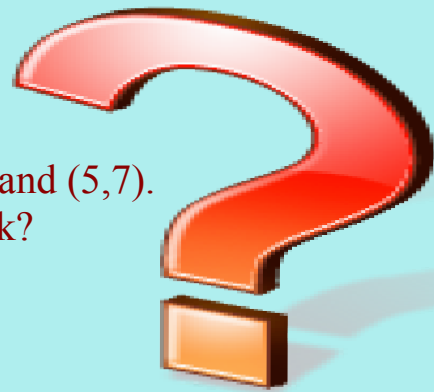
It is easy with the Slope formula!

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





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



$$\text{Let } (x_1, y_1) \text{ and } (x_2, y_2) \\ (2, k) \text{ and } (5, 7) \quad m = \frac{2}{3}$$

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

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

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

$$3(7 - k) = 6$$

$$21 - 3k = 6 - 21$$

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

$$k = 5$$



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

$$\begin{matrix} x_1 & y_1 & x_2 & y_2 \\ (-7, -8) & (k, -4) & & \end{matrix} \quad m = \frac{-4}{3}$$

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

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

$$\frac{-4}{3} \times \frac{3}{3} = \frac{4}{k+7}$$

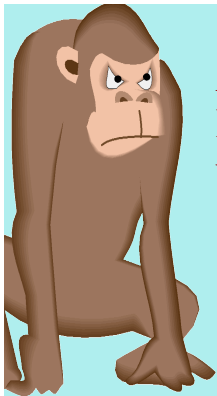
$$-4(k+7) = 12$$

$$-4k - 28 = 12 + 28$$

$$\begin{aligned} -4k &= 40 \\ k &= -10 \end{aligned}$$

$$k = -10$$





A line passes through the points $(2, k)$ and $(k, -3)$.
If the slope is perpendicular to $1/2$, what is the value of k ?



$$\begin{matrix} x_1 & y_1 & & x_2 & y_2 \\ (2, & k) & & (k, & -3) \end{matrix} \quad m = \frac{-2}{1}$$

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

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

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

$$-2k + 4 = -3 - k - 4 \quad (k = 7)$$

$$-2k + k = -7$$

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



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



$$\begin{matrix} x_1 & y_1 & & x_2 & y_2 \\ (2k) & 11 & & (k) & (k+3) \end{matrix}$$

$$m = \frac{3}{5}$$

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

$$\frac{3}{5} = \frac{1(k+3) - 11}{1k - 2k}$$

$$\frac{3}{5} = \frac{k+3-11}{-1k}$$

$$\frac{3}{5} = \frac{k-8}{-1k}$$

$$\begin{aligned} \frac{3}{5} &= \frac{k-8}{-1k} \\ 5(k-8) &= -3k \\ 5k - 40 &= -3k \\ 5k + 3k &= 40 \\ 8k &= 40 \\ k &= \frac{40}{8} \\ k &= 5 \end{aligned}$$



