Finding "k"

When given the value of the slope, you can find a missing 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?

Given:

$x_1 = 2$

$y_1 = k$

$x_2 = 5$

$y_2 = 7$

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

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

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

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

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

$21 - 3k = 6$

$-3k = 6 - 21$

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

$k = 5$

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

Given:

$x_1 = -7$

$y_1 = -8$

$x_2 = k$

$y_2 = -4$

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

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

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

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

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

$$-4k - 28 = 12$$

$$-4k = 12 + 28$$

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

$$k = -10$$

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

Given:

$x_1 = 2$

$y_1 = k$

$x_2 = k$

$y_2 = -3$

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

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

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

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

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

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

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

$$\boxed{k = 7}$$

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

Given:

$x_1 = 2k$

$y_1 = 11$

$x_2 = k$

$y_2 = k+3$

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

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

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

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

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

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

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

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

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

$$\boxed{k = 5}$$

$2k$	$k+3$
$2(5)$	$5+3$
10	8

Points: $(10, 11)$

$(5, 8)$

Homework

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① $-\frac{1}{2} = \frac{2k-k}{-3-2}$

$\frac{-1}{2} = \frac{k}{-5}$

$\frac{2k}{2} = \frac{5}{2}$

$\boxed{k = \frac{5}{2}}$

② $\frac{2}{3} = \frac{y-(-3)}{4-2}$

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

$3y+9 = 4$

$\frac{3y}{3} = \frac{-5}{3}$

$\boxed{y = -\frac{5}{3}}$

③ $\frac{-5}{3} = \frac{10-0}{p-0}$

$\frac{-5}{3} = \frac{10}{p}$

$\frac{-5p}{-5} = \frac{30}{-5}$

$\boxed{p = -6}$

④ $\frac{6}{7} = \frac{-3z-6}{2-3z}$

$6(2-3z) = 7(-3z-6)$

$12-18z = -21z-42$

$-18z+21z = -42-12$

$\frac{3z}{3} = \frac{-54}{3}$

$\boxed{z = -18}$

⑤ a) $\frac{4}{1} = \frac{k-1}{2-4}$

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

$k-1 = -8$

$\boxed{k = -7}$

b) $\frac{-1}{2} = \frac{k-(-6)}{-5-3}$

$\frac{-1}{2} = \frac{k+6}{-8}$

$2k+12 = 8$

$2k = 8-12$

$\frac{2k}{2} = \frac{-4}{2}$

$\boxed{k = -2}$

5) c) $\frac{2}{3} = \frac{7-(-3)}{0-k}$

$\frac{2}{3} \times \frac{10}{-k}$

$\frac{-2k}{-2} = \frac{30}{-2}$

$k = -15$

d) $\frac{4}{5} = \frac{4-1}{k-2k}$

$\frac{4}{5} \times \frac{3}{-k}$

$\frac{-4k}{-4} = \frac{15}{-4}$

$k = -\frac{15}{4}$

⑥ $\frac{-\frac{1}{3}}{-\frac{1}{3}k-1} = \frac{2-2k}{}$

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

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

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

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

$\frac{19k}{3} \times \frac{5}{1}$

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

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

⑦ undefined

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

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

$-3k-1 = 0$

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

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

A line passes through the points (-4, 2k) and (6, k+2). If the slope is perpendicular to a slope of 2 , what is the value of k?

Given:

$x_1 = -4$

$y_1 = 2k$

$x_2 = 6$

$y_2 = k+2$

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

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

$-\frac{1}{2} = \frac{k+2-2k}{6-(-4)}$

$-\frac{1}{2} = \frac{-k+2}{10}$

$2(-k+2) = -1(10)$

$-2k+4 = -10$

$-4 \quad -4$

$\frac{-2k}{-2} = \frac{-14}{-2}$

$\boxed{k = 7}$

① $\frac{4}{1} = \frac{-8+3w}{7-4}$

$\frac{4}{1} = \frac{-8+3w}{3}$

$-8+3w = 12$

$3w = 20$

$\boxed{w = \frac{20}{3}}$

② $\frac{-3}{1} = \frac{4k-6k}{-3-5}$

$\frac{-3}{1} = \frac{-2k}{-8}$

$-2k = 24$

$\boxed{k = -12}$

③ $\frac{-4}{3} = \frac{-4b+3}{4-2b}$

$-16+8b = -12b+9$

$20b = 25$

$\boxed{b = \frac{5}{4}}$

④ parallel to x-axis

$\frac{0}{1} = \frac{h-2}{8+3h}$

$h-2 = 0$

$\boxed{h = 2}$

parallel to y-axis

⑤ $\frac{1}{0} = \frac{-2-8f}{2f-4}$

$2f-4=0$

$2f=4$

$\boxed{f=2}$

⑥ $m = \frac{-2-3}{3-8}$

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

$\boxed{m=1}$

perpendicular to y-axis

⑦ $\frac{0}{-1} = \frac{-2k-6k}{-2-3}$

$\frac{0}{-1} = \frac{-8k}{-5}$

$8k = 0$

$\boxed{k = 0}$

⑧a) $\frac{-2}{3} = \frac{5-3}{-2k-2}$

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

$4k+4 = 6$

$4k = 2$

$\boxed{k = \frac{1}{2}}$

⑧ b) $\frac{1}{0} = \frac{1-2k}{-3k+5}$

$-3k+5=0$

$-3k=-5$

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

c) $\frac{0}{1} = \frac{2k-3}{7+k}$

$2k-3=0$

$2k=3$

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

⑧ $\frac{-2}{1} = \frac{-4k-2k}{6-8}$

$\frac{-2}{1} = \frac{-6k}{-2}$

$-6k = 4$

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

⑨ $m = \frac{-3+2}{9-7}$

$\boxed{m = -\frac{1}{2}}$