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

c. L1: (2 , -1) , (5 , -7) and L2: (0 , 0) , (-1 , 2)

Slope $L_1 = \frac{-7-(-1)}{5-2} = \frac{-6}{3} = -2$

Slope $L_2 = \frac{2-0}{-1-0} = \frac{2}{-1} = -2$

$L_1 \parallel L_2$

d. L1: (1 , 0) , (2 , 0) and L2: (5 , -5) , (-10 , -5)

Slope $L_1 = \frac{0-0}{2-1} = \frac{0}{1} = 0$

Slope $L_2 = \frac{-5-(-5)}{-10-5} = \frac{0}{-15} = 0$

$L_1 \parallel L_2$

e. L1: (-2 , 5) , (-2 , 7) and L2: (5 , 1) , (5 , 13)

Slope $L_1 = \frac{7-5}{-2-(-2)} = \frac{2}{0}$

= undefined

Slope $L_2 = \frac{13-1}{5-5} = \frac{12}{0}$

undefined

$L_1 \parallel L_2$

Write the slope-intercept form of the equation of the line through the given point with the given slope. Show your work.

1) through: $(-1, 1)$, slope $= 4$

2) through: $(1, 5)$, slope $= 3$

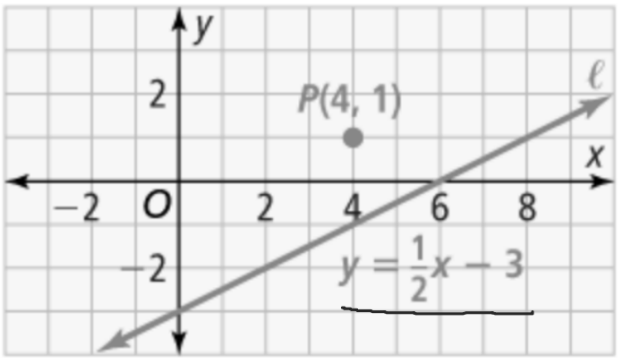
3) through: $(2, -2)$, slope $= -\frac{5}{6}$

4) through: $(-2, 3)$, slope $= -\frac{5}{7}$

5) through: $(-1, -2)$, slope $= \frac{3}{2}$

6) through: $(-2, 3)$, slope $= -1$

A. What is an equation of the line through *P* that is parallel to ℓ?



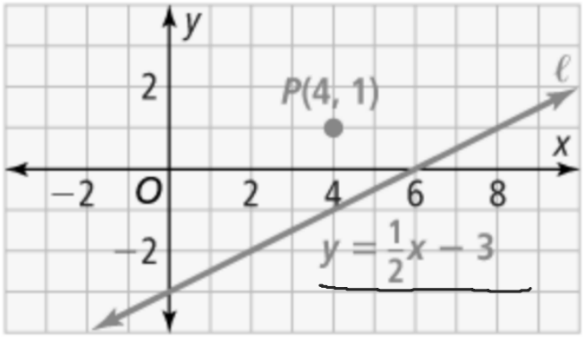
$P(4,1) \quad m = \frac{1}{2}$

$y - 1 = \frac{1}{2}(x - 4)$

$y - 1 = \frac{1}{2}x - 2$

$y = \frac{1}{2}x - 1$

B. What is the equation of the line through *P* that is perpendicular to $\overline{\ell}$?



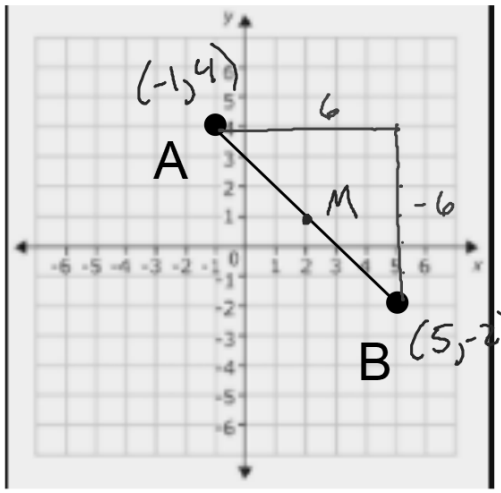
Slope $\ell = \frac{1}{2}$ Slope of $\perp = \frac{-2}{1} = -2$

$(4,1)$ $m = -2$

$y - 1 = -2(x - 4)$

$y - 1 = -2x + 8$

$\boxed{y = -2x + 9}$



Find the midpoint of segment AB. $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ $\left(\frac{-1+5}{2} \quad \frac{4+(-2)}{2}\right)$

$M(2,1)$

Find the equation of the line perpendicular to AB that goes through the midpoint.

Slope $AB = \frac{-6}{6} = -1$ Slope $\perp$ line $= 1$

midpoint $(2,1)$

Slope $= 1$

$y-1 = 1(x-2)$

$y-1 = x-2$

$y = x-1$

Write the slope-intercept form of the equation of the line described.

through: $(2, 2)$, parallel to $y = x + 4$

$m = 1$

$y - 2 = 1(x - 2)$

$y - 2 = x - 2$

$y = x$

through: $(2, -4)$, parallel to $y = 3x + 2$

$m = 3 \quad (2, -4)$

$y + 4 = 3(x - 2)$

$y + 4 = 3x - 6$

$y = 3x - 10$

through: $(2, -1)$, parallel to $y = -\frac{2}{5}x + 3$

$m = -\frac{2}{5} \quad (2, -1)$

$y + 1 = -\frac{2}{5}(x - 2)$

$y + 1 = -\frac{2}{5}x + \frac{4}{5}$

$-1 \qquad -1$

$y = -\frac{2}{5}x - \frac{1}{5}$

$\frac{4}{5} - 1$

$\frac{4}{5} - \frac{5}{5} = -\frac{1}{5}$

Write the slope-intercept form of the equation of the line described.

through: $(1, -5)$, perp. to $y = \frac{1}{8}x + 2$

$m = -8 \quad (1, -5)$

$y + 5 = -8(x - 1)$

$y + 5 = -8x + 8$

$y = -8x + 3$

through: $(3, 1)$, perp. to $y = -\frac{2}{3}x + 4$

$m = \frac{3}{2} \quad (3, 1)$

$y - 1 = \frac{3}{2}(x - 3)$

$y - 1 = \frac{3}{2}x - \frac{9}{2}$

$+1 \qquad +\frac{2}{2}$

$y = \frac{3}{2}x - \frac{7}{2}$

$-\frac{2}{1} \qquad \frac{1}{2}$

through: $(3, 4)$, perp. to $y = -2x - 4$

$m = \frac{1}{2} \quad (3, 4)$

$y - 4 = \frac{1}{2}(x - 3)$

$y - 4 = \frac{1}{2}x - \frac{3}{2}$

$+4 \qquad +4$

$y = \frac{1}{2}x + \frac{5}{2}$

$-\frac{3}{2} + 4$

$-\frac{3}{2} + \frac{8}{2}$

$\frac{5}{2}$

4. What are equations of lines parallel and perpendicular to the given line k passing through point T?

a. $y = -3x + 2;\ T(3,\ 1)$

$y - 1 = \frac{1}{3}(x-3)$

$y - 1 = \frac{1}{3}x - 1$

$y = \frac{1}{3}x$

b. $y = \frac{3}{4}x - 5;\ T(12, -2)$

$y + 2 = \frac{3}{4}(x-12)$

$y + 2 = \frac{3}{4}x - 9$

$y = \frac{3}{4}x - 11$

10. What is an equation for the line parallel to $y = -x + 7$ that passes through $(7, -2)$?

$$y + 2 = -(x - 7)$$

$$y + 2 = -x + 7$$

$$y = -x + 5$$

11. What is an equation for the line perpendicular to $y = 3x - 1$ that passes through $(-9, -2)$?

$$y + 2 = -\frac{1}{3}(x + 9)$$

$$y + 2 = -\frac{1}{3}x - 3$$

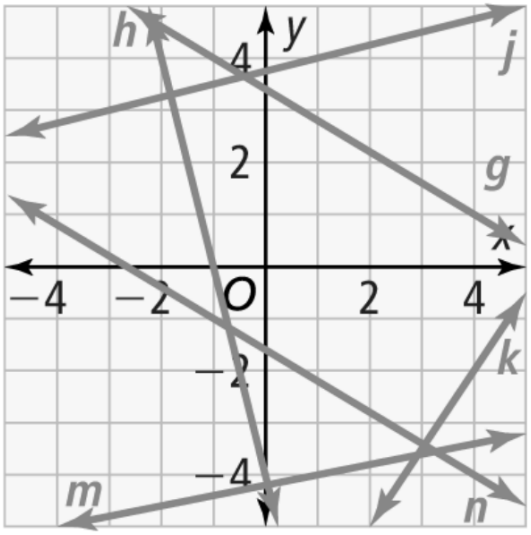
$$y = -\frac{1}{3}x - 5$$

Are lines *g* and *n* parallel?

Are lines *j* and *m* parallel?

. Are lines *n* and *k* perpendicular?

Are lines *h* and *j* perpendicular?



VL C.5 Due Friday 9/10 @ 11pm