

Name: _____ Blk: _____

Date: _____

Mathematics 10
6.1ab Review

Key

1) Which lines is the point $(-1, \frac{2}{3})$ on?

a) $3x - 6y = -7$

b) $x = 5$

c) $y = \frac{1}{2}x + \frac{1}{6}$

d) $y - \frac{26}{3} = 2(x - 3)$

$3(-1) - 6(\frac{2}{3}) = -7 ?$

$-1 = 5 ?$

$\frac{2}{3} = \frac{1}{2}(-1) + \frac{1}{6} ?$

$\frac{2}{3} - \frac{26}{3} = 2(-1 - 3) ?$

$-3 - 4 = -7 ?$

NO

$\frac{2}{3} = -\frac{1}{2} + \frac{1}{6} ?$

NO

$-\frac{24}{3} = 2(-4)$

$-7 = -7 \checkmark$

YES

$\frac{1}{3} = \frac{-3+1}{6} \rightarrow \frac{2}{3} = \frac{-2}{6}$

$-8 = -8 \checkmark$

YES

2) For the following slopes, write the slope that is **parallel** to it.

a) $m = 1$

b) $m = 0$

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

d) $m = -3$

e) $m = -\frac{3}{14}$

1

0

$\frac{3}{2}$

-3

$-\frac{3}{14}$

3) For the following slopes, write the slope that is **perpendicular** to it.

a) $m = 1$

b) $m = 0$

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

d) $m = -3$

e) $m = -\frac{3}{14}$

$m_{\perp} = -1$

$m_{\perp} = \emptyset$

$m_{\perp} = -\frac{2}{3}$

$m_{\perp} = \frac{1}{3}$

$m_{\perp} = \frac{14}{3}$

4a) Determine the slope of each line that

i) passes through A(-4, 7) and B(6, 3)

$x_1 \ y_1 \quad x_2 \ y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 7}{6 - (-4)} = \frac{-4}{10} = \frac{-2}{5}$

ii) is given by the equation $5x - 2y + 7 = 0$

$+2y \quad +2y$

$5x + 7 = 2y$

$y = \frac{5}{2}x + \frac{7}{2}$

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

b) Are the lines in part a parallel, **perpendicular**, or neither?

5) A linear function has $f(3) = -7$ and $f(-2) = 18$.

a) What is the slope?

$(3, -7) \quad (-2, 18)$
 $x_1 \ y_1 \quad x_2 \ y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{18 - (-7)}{-2 - 3} = \frac{25}{-5} = -5$

b) What is the equation of this line in point-slope form? (Give 2 answers)

$y - y_1 = m(x - x_1)$
using $(3, -7)$

using $(-2, 18)$

$y + 7 = -5(x - 3)$

$y - 18 = -5(x + 2)$

c) What is the equation of this line in slope-intercept form?

using $y + 7 = -5(x - 3)$
 $y + 7 = -5x + 15$
 $-7 \quad -7$

$y = -5x + 8$

$$\begin{array}{cc} x_1, y_1 & x_2, y_2 \\ (15, 0) & (0, 21) \end{array}$$

6) A line has x-intercept 15 and y-intercept 21.

a) What is the slope of this line?

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{21 - 0}{0 - 15} = \frac{21}{-15} = \boxed{\frac{7}{-5}}$$

b) What is the equation of this line in slope-intercept form?

$$m = -\frac{7}{5} \quad b = 21$$

$$\therefore y = -\frac{7}{5}x + 21$$

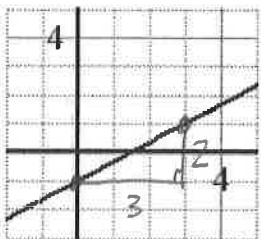
7) Write the equation of the line in

a) slope-intercept form

$$m = \frac{\text{rise}}{\text{run}} = \frac{2}{3} \quad b = -1$$

$$y = mx + b$$

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



b) point-slope form (don't use y-intercept as a point)

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

$$y - y_1 = m(x - x_1)$$

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

8) Write the equation of the line in

a) point-slope form (2 answers)

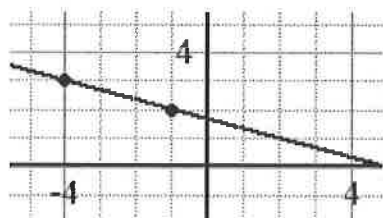
$$\begin{array}{cc} (-4, 3) & (-1, 2) \\ x_1, y_1 & x_2, y_2 \end{array}$$

$$m = \frac{2 - 3}{-1 - 4} = \frac{-1}{-5} = \frac{1}{5}$$

$$y - y_1 = m(x - x_1)$$

using $(-4, 3)$

$$\boxed{y - 3 = \frac{1}{5}(x + 4)} \quad \text{OR} \quad \boxed{y - 2 = \frac{1}{5}(x + 1)}$$



using $(-1, 2)$

b) slope-intercept form

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

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

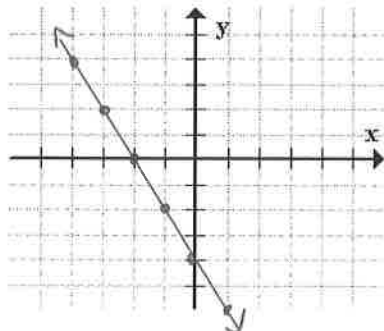
$$y = -\frac{1}{3}x - \frac{1}{3} + \frac{2}{1} \cdot \frac{3}{3}$$

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

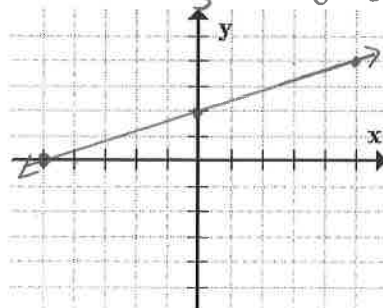
$$\boxed{y = -\frac{1}{3}x + \frac{5}{3}}$$

9) Graph each line.

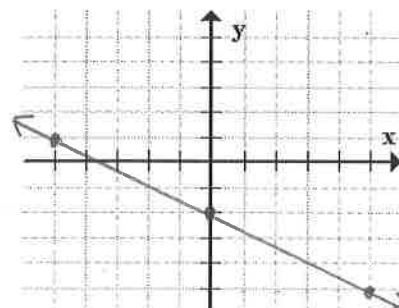
a) $y - 2 = -2(x + 3)$
pt $(-3, 2)$ $m = -2$



b) $2x - 5y + 10 = 0$
 $2x + 10 = 5y$ $y = \frac{2}{5}x + 2$



c) $y = -\frac{3}{5}x - 2$



10) Write an equation for the line that passes through E(4, -3) and is

a) perpendicular $y+1 = -\frac{5}{7}(x-4)$

$$m = -\frac{5}{7} \quad \text{pt}(4, -3)$$

$x_1 \quad y_1$

$$m_{\perp} = \frac{7}{5}$$

$$y - y_1 = m(x - x_1)$$

$$y + 3 = \frac{7}{5}(x - 4)$$

b) parallel to $3x - 4y = 12$

solve y to get in $y = mx + b$ form
so can see slope

$$\frac{3x - 12 = 4y}{4}$$

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

$$m = \frac{3}{4} \quad \text{pt}(4, -3)$$

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

11) Write the equation of the line that passes through (-2, 12) and (5, -3) in slope intercept form and point-slope form.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 12}{5 - (-2)} = \frac{-15}{7}$$

pt (5, -3)

$$y - y_1 = m(x - x_1)$$

$$y + 3 = -\frac{15}{7}(x - 5)$$

pt-slope form

$$y + 3 = -\frac{15}{7}(x - 5)$$

$$y + 3 = -\frac{15}{7}x + \frac{75}{7}$$

$-3 \qquad -3$

$$y = -\frac{15}{7}x + \frac{75}{7} - \frac{21}{7}$$

$$y = -\frac{15}{7}x + \frac{54}{7}$$

12) A line goes through (-2, 10) and whose slope is $-\frac{5}{8}$. What is its y-intercept?

$$y = mx + b$$

$$10 = -\frac{5}{8}(-2) + b$$

$$10 = \frac{5}{4} + b$$

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

$$b = \frac{10}{1} - \frac{5}{4} = \frac{40}{4} - \frac{5}{4} = \frac{35}{4}$$

$$y \text{ int is } \frac{35}{4}$$

13) A line goes through (-2, 10) and has y-intercept 99. What is its slope?

$$y = mx + b$$

$$10 = m(-2) + 99$$

$$-99 = -2m$$

$$-89$$

$$-2$$

$$m = \frac{89}{2}$$

14) Write an equation for the line that passes through $S(-13,1)$ and is:

a) parallel to the line $y+8=-5(x+8)$

$m = -5$ pt $(-13,1)$
 Use pt-slope form

$y - y_1 = m(x - x_1)$

$y - 1 = -5(x + 13)$

b) perpendicular to the line $\frac{1}{6}x - \frac{14}{3}y = 12$.

To find slope solve for y to get in $mx+b$ form
 $\frac{1}{6}x - 12 = \frac{14}{3}y$ multiply both sides by 3

$3(\frac{1}{6}x - 12 = \frac{14}{3}y)$

$\frac{1}{2}x - 36 = 14y$

$\frac{1}{28}x - \frac{18}{7} = y$

$m = \frac{1}{28}$

$m_{\perp} = -28$ pt $(-13,1)$

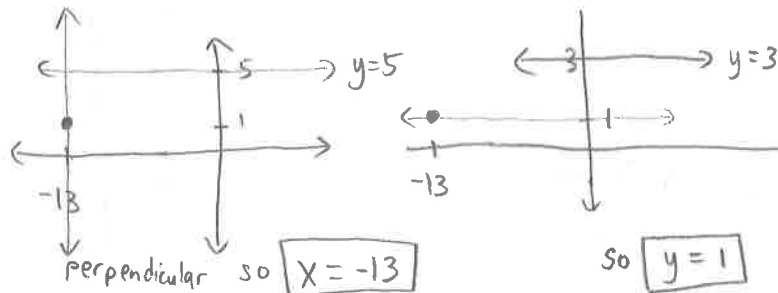
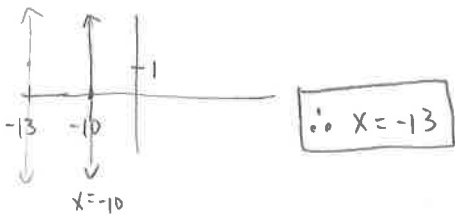
$\therefore y - 1 = -28(x + 13)$

$\frac{1}{2} \div \frac{14}{3} = \frac{1}{2} \cdot \frac{3}{14} = \frac{3}{28}$

c) parallel to $x = -10$

d) perpendicular to $y = 5$

e) parallel to $y = 3$.



15) Write the equation of the line that is perpendicular to $3x - 4y = 10$ and has the same y-intercept as

$y - 7 = \frac{4}{11}(x + 23)$.
 solve for y so in $mx+b$ form
 then can get 'b' (y-int)

↳ solve for y so in $mx+b$ form
 then get m_{\perp}

$y - 7 = \frac{4}{11}x + \frac{92}{11}$

$y = \frac{4}{11}x + \frac{92}{11} + \frac{77}{11}$

$y = \frac{4}{11}x + \frac{169}{11}$ $b = \frac{169}{11}$

$3x - 4y = 10$
 $3x - 10 = 4y$

$\frac{3}{4}x - \frac{5}{2} = y$

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

so $m_{\perp} = -\frac{4}{3}$

Since $m_{\perp} = -\frac{4}{3}$

$b = \frac{169}{11}$

then

$y = mx + b$

$y = -\frac{4}{3}x + \frac{169}{11}$

16) A line goes through the points $A(-1,-5)$ and $B(3,y)$ with slope $-\frac{3}{2}$. What is the coordinate of B?

$x_1 \ y_1 \quad x_2 \ y_2 \quad m$

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

$-\frac{3}{2} = \frac{y + 5}{3 + 1}$

$-\frac{3}{2} = \frac{y + 5}{4}$

cross multiply

$-3(4) = 2(y + 5)$

$-12 = 2y + 10$

$-22 = 2y$

$y = -11$

$\therefore B(3, -11)$