

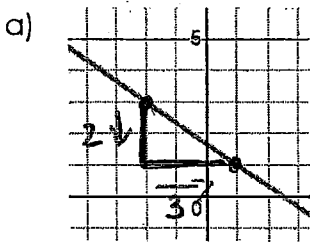
Name: _____

Unit 5 – Review

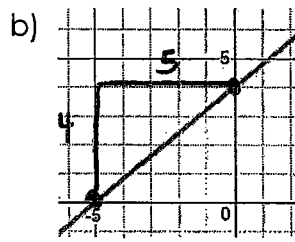
Equation of a line:	Slope of a line:
Slope intercept form: $y = mx + b$	$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$
Slope-point form: $y - y_1 = m(x - x_2)$	
General Form: $Ax + By + C = 0$	

Show your work and simplify answers where necessary.

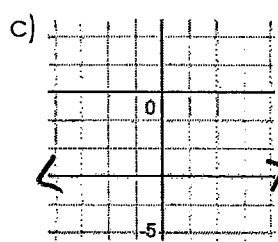
1. Find the slope of each line.



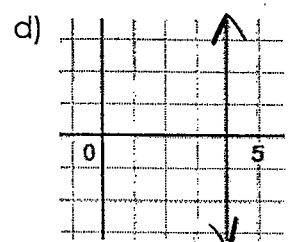
$$m = -\frac{2}{3}$$



$$m = \frac{4}{5}$$



Horizontal line
 $m = 0$



Vertical line
 $m = \text{undefined}$

2. Using the formula, determine the slope of the line that passes through:

a) $A(-6, -8)$ and $B(-1, 2)$
 $x_1 \ y_1 \quad x_2 \ y_2$

$$m = \frac{2 - (-8)}{-1 - (-6)} = \frac{10}{5} = 2$$

b) $C(-3, 7)$ and $D(5, -5)$
 $x_1 \ y_1 \quad x_2 \ y_2$

$$m = \frac{-5 - 7}{5 - (-3)} = \frac{-12}{8} = -\frac{3}{2}$$

3. Determine if the following lines are parallel, perpendicular, or neither. Justify your answer.

a) $J(-3, 3)$ & $K(-1, 7)$ and $L(-1, 2)$ & $M(5, -1)$
 $x_1 \ y_1 \quad x_2 \ y_2 \quad x_1 \ y_1 \quad x_2 \ y_2$

$$JK = \frac{7 - 3}{-1 - (-3)}$$

$$JK = \frac{4}{2}$$

$$JK = 2$$

$$LM = \frac{-1 - 2}{5 - (-1)}$$

$$LM = -\frac{3}{6}$$

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

$JK \perp LM$
perpendicular

#3

2

b) $P(-4, -2)$ & $Q(-1, 7)$ and $R(2, 5)$ & $S(4, -1)$
 $x_1 \ y_1 \quad x_2 \ y_2 \quad x_1 \ y_1 \quad x_2 \ y_2$

$$PQ = \frac{7 - (-2)}{-1 - (-4)}$$

$$RS = \frac{-1 - 5}{4 - 2}$$

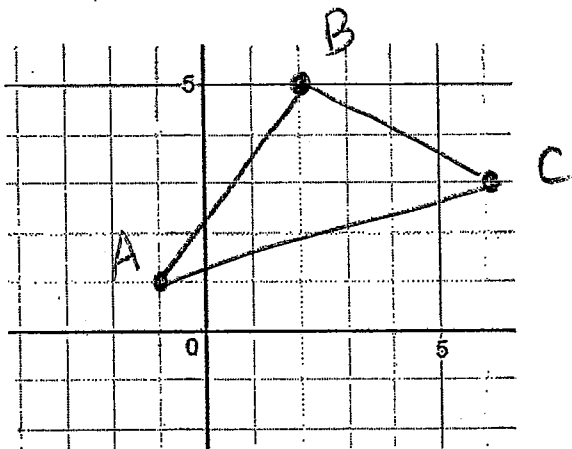
Neither

$$PQ = \frac{9}{3} = 3$$

$$RS = \frac{-6}{2} = -3$$

4. The vertices of triangle ABC are $A(-1, 1)$, $B(2, 5)$, and $C(6, 3)$. Is triangle ABC a right triangle? Justify your answer using the slopes of the sides.

looks like $AB \perp BC$



$$AB = \frac{5 - 1}{2 - (-1)}$$

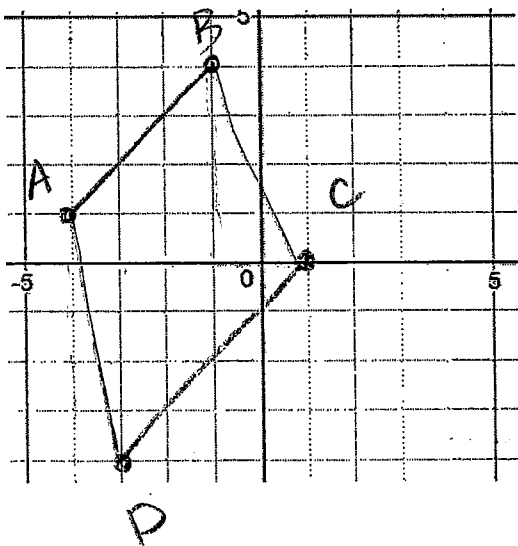
$$BC = \frac{3 - 5}{6 - 2}$$

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

$$BC = \frac{-2}{4} = \left(-\frac{1}{2}\right)$$

Not negative reciprocals
Not Perpendicular
Not a Right Δ .

5. The vertices of quadrilateral $ABCD$ are $A(-4, 1)$, $B(-1, 4)$, $C(1, 0)$, and $D(-3, -4)$. Is quadrilateral $ABCD$ a parallelogram? Justify your answer using the slopes of the sides.



$$AB = \frac{4 - 1}{-1 - (-4)}$$

$$CD = \frac{-4 - 0}{-3 - 1}$$

$$AB = \frac{3}{3} = 1$$

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

$AB \parallel CD$

$$BC = \frac{0 - 4}{1 - (-1)}$$

$$AD = \frac{-4 - 1}{-3 - (-4)}$$

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

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

~~$BC \parallel AD$~~

Not a Parallelogram

6. Sketch the graph of each linear function. Determine the slope and y-intercept of each function.

a) $y = -3x + 4$

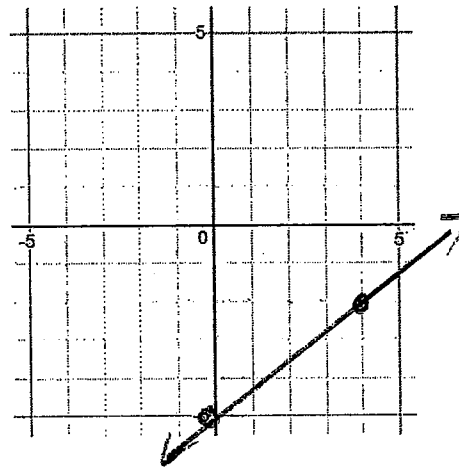
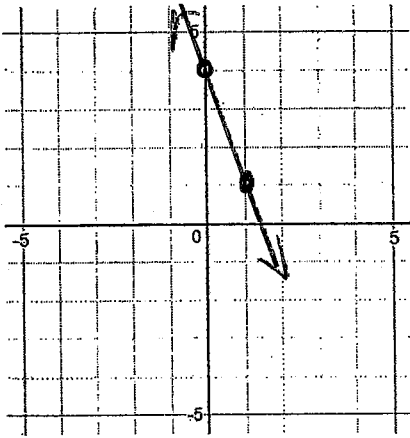
b) $y = \frac{3}{4}x - 5$

Slope: -3

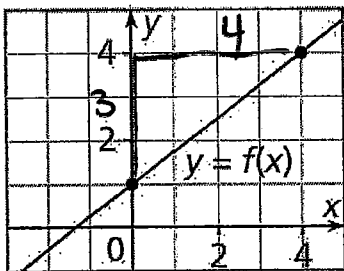
Slope: $\frac{3}{4}$

Y-intercept: 4

Y-intercept: -5



7. a) Write an equation in slope-intercept form for the graph below.



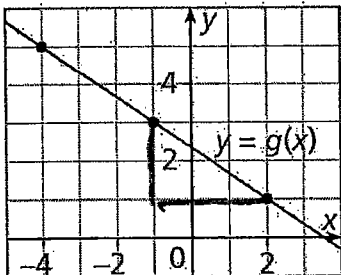
$b = 1$ $m = \frac{3}{4}$

$y = \frac{3}{4}x + 1$

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

$y = mx + b$

b) Write an equation in slope-point form and in slope-intercept form for the graph below.



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

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

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

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

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

Point (2, 1)

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

8. Write each equation in #7 in general form.

a) $y = \frac{3}{4}x + 1$

$4y = 3x + 4$

$0 = 3x - 4y + 4$

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

$3y = -2x + 7$

$2x + 3y - 7 = 0$

9. Write an equation for the line that passes through point A (-2, 3) and is perpendicular to $y = 2x + 1$.

a) Slope-point form

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

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

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

b) Slope-intercept form

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

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

10. Write an equation for the line that passes through point E (-4, -3) and is parallel to $y + 1 = \frac{5}{7}(x - 4)$.

a) Slope-point form

Point $(-4, -3)$

$m = \frac{5}{7}$

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

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

b) Slope-intercept form

$y + 3 = \frac{5}{7}x + \frac{20}{7}$

$y = \frac{5}{7}x + \frac{20}{7} - \frac{21}{7}$

$y = \frac{5}{7}x - \frac{1}{7}$

11. Write an equation in slope-point form for a line whose x-intercept is -3 and the y-intercept is 5.
Sketch the line.

$(-3, 0)$ $(0, 5)$

$$m = \frac{5-0}{0-(-3)}$$

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

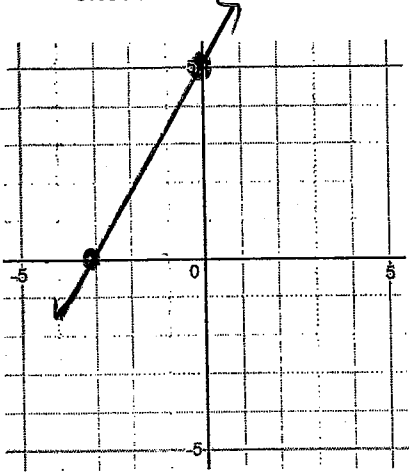
$$y - 5 = \frac{5}{3}(x - 0)$$

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

or

$$y - 0 = \frac{5}{3}(x - (-3))$$

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



12. Given each of the following linear functions:

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

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

a) Identify the slope and a point that the line passes through

slope: 2

a point: $(-3, 4)$

slope: $-\frac{1}{3}$

a point: $(4, -1)$

b) Write each equation in slope-intercept form.

$$y - 4 = 2x + 6$$

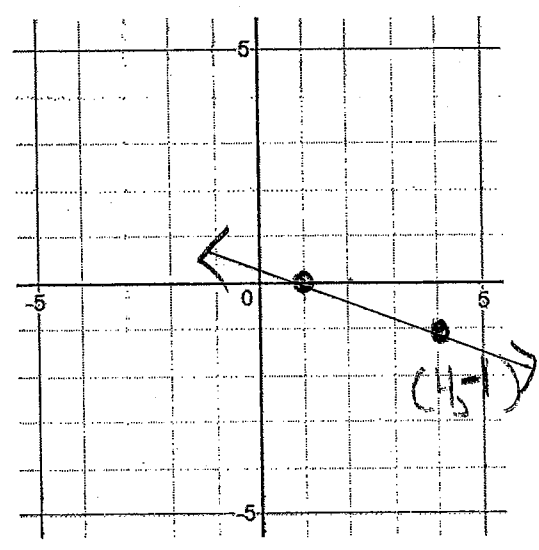
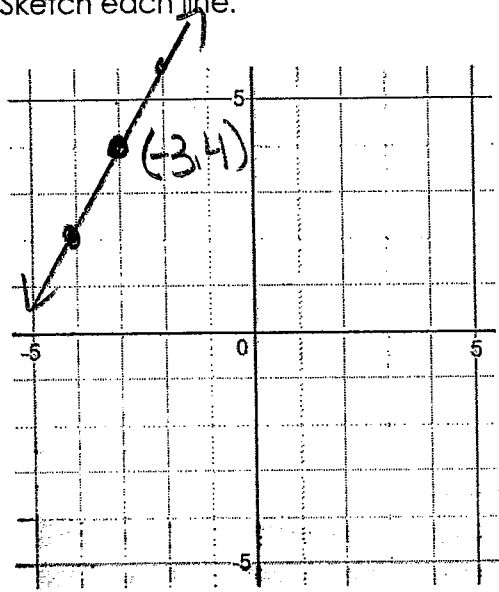
$$y = 2x + 10$$

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

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

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

c) Sketch each line.



13. Write each equation in general form.

a) $y = \frac{1}{5}x + 3$

$5y = x + 15$

$0 = x - 5y + 15$

b) $\frac{1}{4}x + y = 2$

$x + 4y = 8$

$x + 4y - 8 = 0$

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

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

$3y - 6 = x + 4$

$0 = x - 3y + 10$

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

$y + 1 = -\frac{4}{5}x + \frac{8}{5}$

$5y + 5 = -4x + 8$

$4x + 5y - 3 = 0$

14. Determine the coordinates of the intercepts (y-intercept and x-intercept) of each line. Sketch the graph of each linear function.

a) $2x - 4y - 8 = 0$

X-int

$2x - 4(0) - 8 = 0$

$2x = 8$

$x = 4$

$(4, 0)$

y-int

$2(0) - 4y - 8 = 0$

$-4y = 8$

$y = -2$

$(0, -2)$

b) $x - 3y + 12 = 0$

X-int

$x - 3(0) + 12 = 0$

$x = -12$

$(-12, 0)$

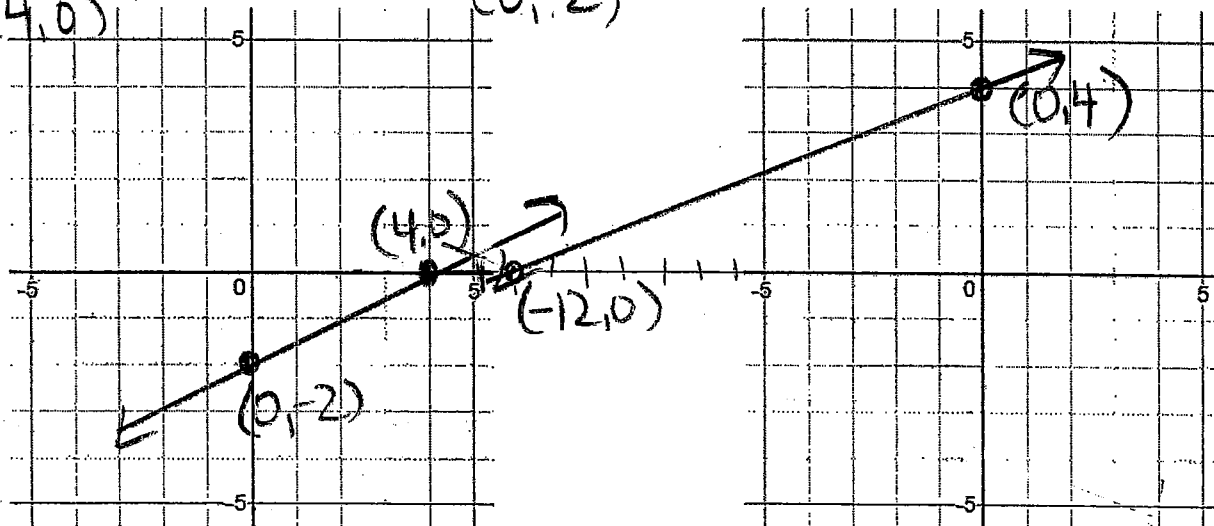
y-int

$0 - 3y + 12 = 0$

$-3y = -12$

$y = 4$

$(0, 4)$



15. Billy had 40\$ in his bank account and then he started to save 15\$ per week.

a) Write an equation (slope-intercept form) to represent the total amount, m dollars, in his bank account after w weeks.

$$M = 15w + 40$$

b) Using the equation you made in (a), how much will Billy have saved in 2 years?

2 years \Rightarrow weeks
 $2(52) = 104$ weeks

$$M = 15(104) + 40$$

$$M = 1560 + 40$$

$$M = 1600$$

$$\$ 1600$$

c) Using the equation you made in (a), after how many weeks will he have 355\$ in his account?

$$355 = 15w + 40$$

$$M = 355$$

$$315 = 15w$$

$$21 = w$$

$$21 \text{ weeks}$$

16. For a home visit, a plumber will charge 75\$ plus \$40 per hour of work.

a) Write an equation in slope-intercept form that represents total cost, C dollars, as a function of hours worked, h .

$$C = 40h + 75$$

b) Using the equation you made in (a), how many hours does the plumber have to work to earn 335\$?

$$C = 335$$

$$335 = 40h + 75$$

$$260 = 40h$$

$$\frac{260}{40} = h$$

$$h = 6.5$$

$$6.5 \text{ hrs}$$