Algebra 1 Unit 3 Test Review Name Answer Key

Complete each problem as directed. Show work for full credit. Hr: Yes

1. Find the slope of the line that contains each pair of points and describe what the slope tells you about the graph of the line. (4 points each)

a. (1, 7) and (1, -3)

$m = \frac{-3-7}{1-1} = \frac{-10}{0}$ → Undefined

Undefined slope means the line is vertical.

b. (-8,2) and (-4, -4)

$m = \frac{-4-2}{-4--8} = \frac{-6}{4} = -\frac{3}{2}$

The line goes down three for every two it goes to the right.

2. Write an equation in slope intercept form for each line. (1 point each)

a. Slope $\frac{-2}{3}$ and y-intercept of 5.

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

b. slope 8 and the point (0,4).

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

$y = 8x + 4$

$y = 8x + 4$

3. Write an equation in point-slope form for the line containing (1,7) with slope 4, then convert the equation to slope-intercept form. (3 points)

$y - 7 = 4(x - 1)$

$y - 7 = 4x - 4$

$+7 \quad +7$

$y = 4x + 3$

4. Write an equation in point-slope form for the line that contains (2,5) and (-6,9). Convert the equation to slope-intercept and standard form. (5 points)

$m = \frac{9-5}{-6-2} = \frac{4}{-8} = -\frac{1}{2}$

$y - 5 = -\frac{1}{2}(x - 2)$ OR $y - 9 = -\frac{1}{2}(x + 6)$

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

$+5 \quad +5$

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

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

$+9 \quad +9$

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

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

5. Write an equation for the line perpendicular to $y = \frac{2}{3}x + 4$ with y-intercept (0,-2). (3 points)

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

$y - -2 = -\frac{3}{2}(x - 0) \Rightarrow y + 2 = -\frac{3}{2}x$

$-2 \quad -2$

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

6. Write an equation for the line parallel to $y = \frac{2}{3}x + 4$ that contains (3, 5). (3 points)

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

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

$+5 \quad +5$

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

7. Determine the slope of the following line: $5x + 3y = 30$ (3 points)

$5x + 3y = 30$
$-5x \quad -5x$
$\frac{3y}{3} = \frac{30 - 5x}{3} \Rightarrow y = 10 - \frac{5}{3}x$

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

8. Graph the equation $6x + 5y = 30$ by finding the intercepts.

a. x-intercept. (3 points)

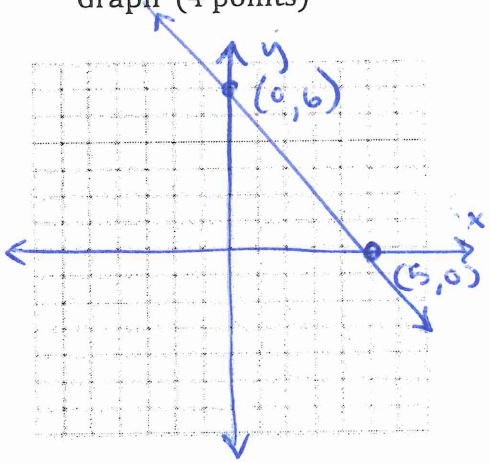
x-int : $y = 0$

$6x + 5(0) = 30$

$\frac{6x}{6} = \frac{30}{6}$ (5,0)

$x = 5$

Graph (4 points)



b. y-intercept. (3 points)

y-int $\Rightarrow x = 0$

$6(0) + 5y = 30$ (0,6)

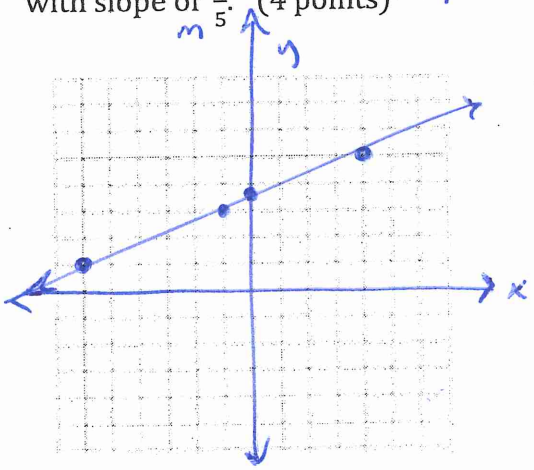
$+5y = 30$

$\frac{5y}{5} = \frac{30}{5}$

$y = 6$

9. Graph the line containing (-1,3) with slope of $\frac{2}{5}$. (4 points)

$m = \frac{2}{5}$ x_1, y_1



$y - 3 = \frac{2}{5}(x - -1)$

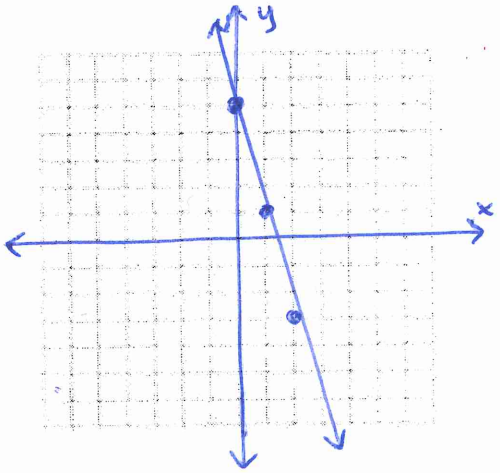
$y - 3 = \frac{2}{5}(x + 1)$

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

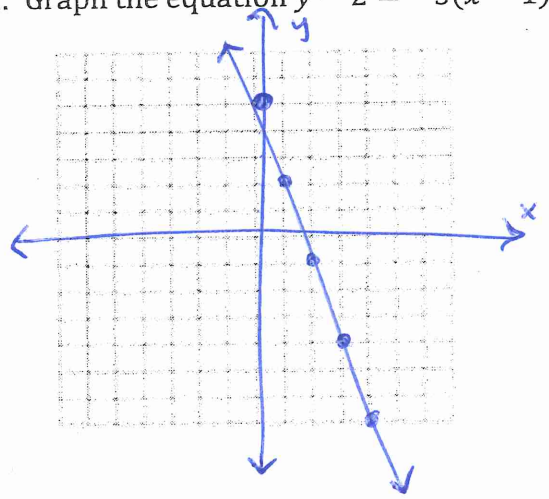
$+3 \qquad +3 \left(\frac{15}{5}\right)$

$y = \frac{2}{5}x + \frac{17}{5}$

10. Use the slope and y-intercept to graph $y = -4x + 5$. (4 points)



11. Graph the equation $y - 2 = -3(x - 1)$ (4 points)



$y - 2 = -3(x-1)$

$y - 2 = -3x + 3$

$+2 \qquad +2$

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

12. Given the equations y = -4x + 3 and y = 3x – 4, which graph would have a steeper line, and how do you know? (4 points)

$y = -4x + 3$ has a slope of -4

$y = 3x - 4$ has a slope of 3

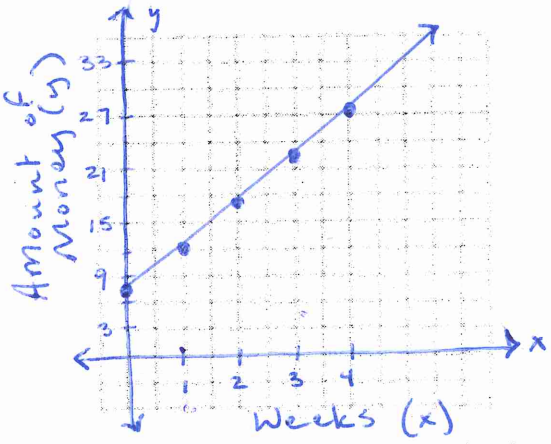
-4 is a steeper slope than 3 because it has more change in the y-variable per 1 unit of change in the x-variable.

13. You are saving money to buy the most recent season of *Modern Family* on DVD. You have $7 saved and earn $5 each week walking the neighbor's dog.

a. Make a coordinate graph to show the amount of money you have after walking the dog for 1, 2, 3, and 4 weeks. (4 points)

x	y
0	7
1	12
2	17
3	22
4	27
~~5~~	~~32~~

Slope!



b. Find the rate of change in the amount of money you make as you walk the dog each week. Justify your response. (4 points)

Each week I make $5. My rate of change is therefore $5 per week.

c. Write an equation to describe the relationship between the money you have and the number of weeks you have been walking the dog. (2 points)

$m = \$5/\text{week}$ $b = (0, \$7)$

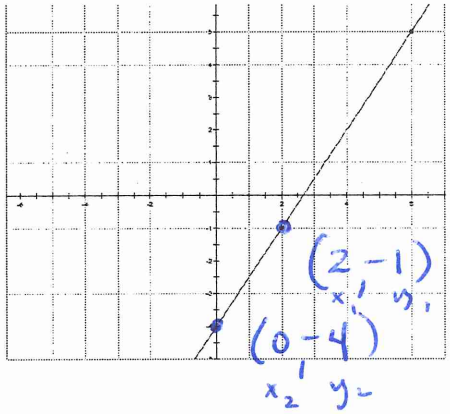
$\boxed{y = 5x + 7}$

d. What is the y-intercept and what does it represent? (4 points)

The y-int is the $7 you initially had saved before walking any dogs.

14. Calculate the slope of the line from the graph. (2 points)

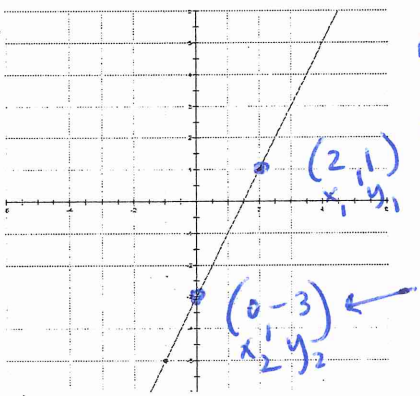
Slope $\frac{3}{2}$



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

15. Write the equation of the following graphs. (2 points each)

a.



$m = \frac{-3-1}{0-2}$

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

$m = 2$

y-int

$y + 3 = 2(x - 0)$ OR $y - 1 = 2(x - 2)$

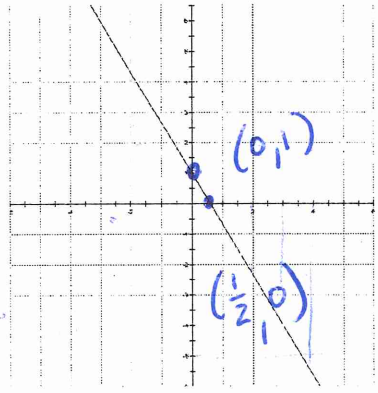
Equation $y = 2x - 3$

"minus"

OR

$-2x + y = 3$

b.



$2x + y = 1$

OR

$y = -2x + 1$

$y - 0 = -2(x - \frac{1}{2})$

$y - 1 = -2(x - 0)$

Equation _____

Write the equation of the line given by the tables below. (3 points each)

16.

x	0	1	2	3	4
y	9	13	17	21	25

+1 +1 +1 +1

+4 +4 +4 +4

Slope = $\frac{4}{1}$ y-int = 9

Equation: $y = 4x + 9$

17.

x	0	2	4	6	8
y	7	3	-1	-5	-9

+2 +2 +2 +2

+4 +4 +4 +4

Slope = $\frac{4}{2} = 2$ y-int = 7

Equation: $y = 2x + 7$

18.

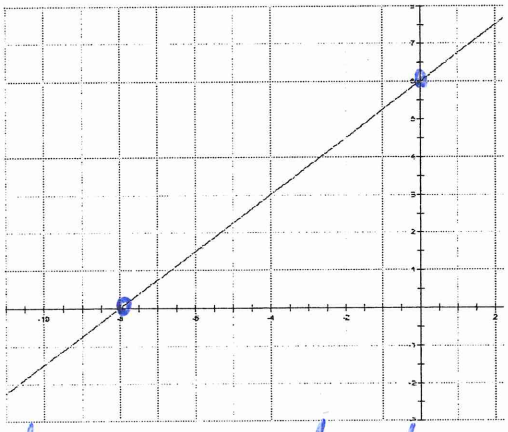
x	3	6	9	12	15
y	-10	-8	-6	-4	-2

$(3, -10)$ $(6, -8)$

$m = \frac{-8 - -10}{6 - 3} = \frac{2}{3}$

Equation: $y + 10 = \frac{2}{3}(x - 3)$

19. Determine the x- and y-intercepts from the following graph: (2 points)

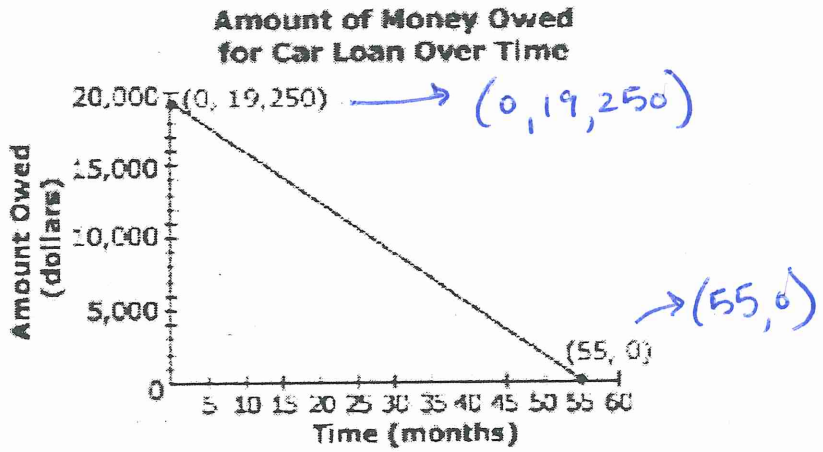


x-intercept $(-8, 0)$

y-intercept $(0, 6)$

These must be listed as coordinates or they are incorrect.

20. You get a loan in order to buy a car. The graph below shows your payment plan for his car loan.



(0, 19,250)

(55, 0)

You pay the same amount of money on his loan each month.

a. What does the *x*-intercept represent? (1 point)

The time in months when the amount you owe is $0.

b. What does the y-intercept represent? (1 point)

The initial amount of money that you owe.

c. What does the slope represent? (1 point)

The rate in which what you owe decreases over time.

21. Solve each equation. (4 points each)

a. $2x - 1(5x + 8) = 32$

$2x - 5x - 8 = 32$

$-3x - 8 = 32$

$+8 \quad +8$

$-3x = 40$

$x = \frac{-40}{3}$

b. $8 - 3n = 2n + 9$

$-2n \quad -2n$

$8 - 5n = 9$

$-8 \quad -8$

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

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

22. Simplify the expression. $(5x - 6y) - (x + y)$ (3 points)

$1(5x - 6y) - 1(x + y)$

$5x - 6y - x - y$

$5x - x - 6y - y \Rightarrow 4x - 7y$