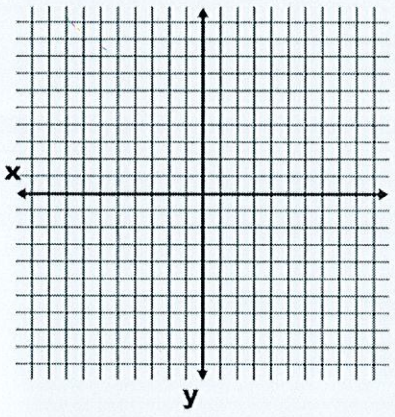
Unit 3 - Linear Equations Study Guide

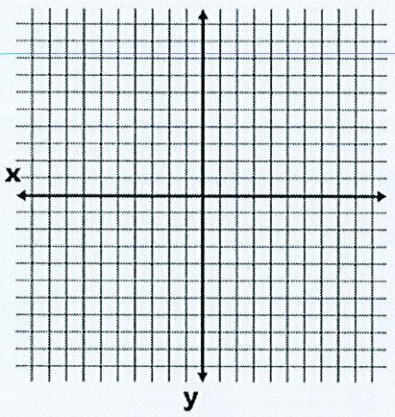
Name:_____

Part 1. GRAPHING: Graph each equation on the coordinate plane provided.

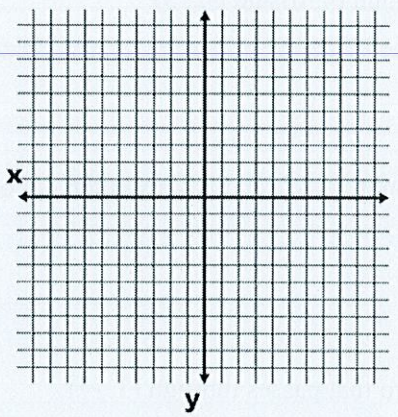
1.) $y = \frac{2}{3}x$.



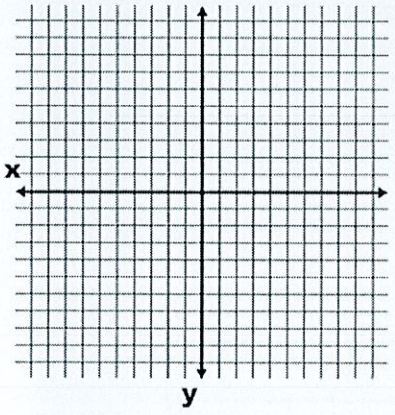
2.) 3x+5y=15



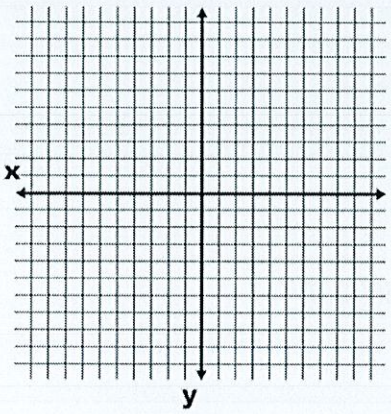
3.) $y - 4 = -\frac{2}{3}(x - 6)$



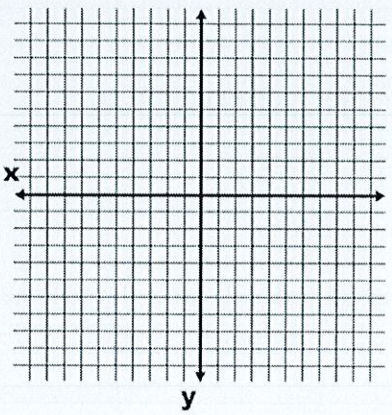
4.) y=4 &x= -2



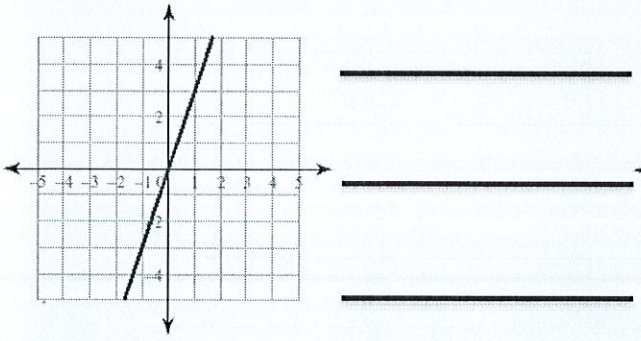
5.) $y = -2x + 5$

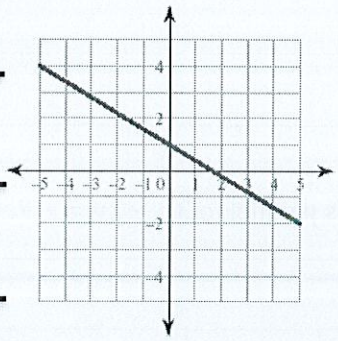


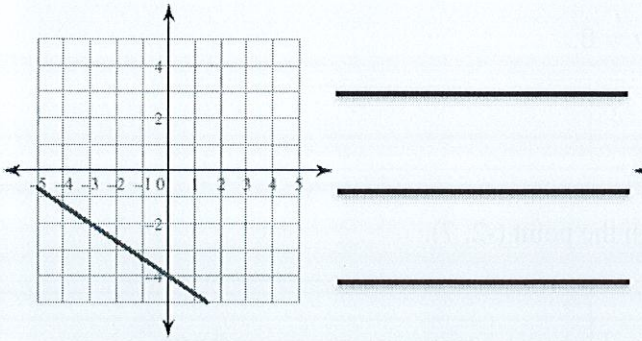
6.) $4x - 5y = 10$

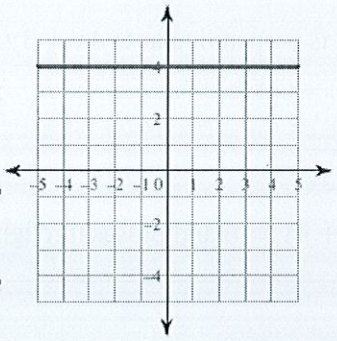


Give the equation for each graph below in ALL FORMS.









<u>Part 2. ALL FORMS</u>: Given the following information, write the equation in all the forms.

Point Slope	Slope Intercept	Standard Form

7.) passes through (4, 6) and (-2, 3)

8.) passes through (4, -2) and has a y-intercept of -3.

9.) slope is zero that passes through (3, -7).

10.) slope $\frac{2}{5}$ and passes through (10, 0).

11.) slope is undefined and passes through the point (-2, 5)

12.) (-4,6)&(-3,8)

13.) line that passes through (-2, 6) and is parallel to $3x - 2y = -7$.

14.) line that passes through (-12, 4) and is perpendicular to $4x + 3y = 8$.

15.) The line parallel to the graph of $8x + 4y = 6$ and passes through the point (-2, 7).

16.) The line perpendicular to the graph of $9x - 3y = -12$ that passes through (6, 2).

17.) $y - 9 = \frac{3}{4}(x + 6)$

18.) $y = \frac{2}{3}x + 4$

Part 3. Mixed Practice

19.) What is the standard form of the equation of the line through (-7, 8) with slope 3/4? _____

20.) Write the equation of the line in standard form with an x-intercept of -7 and a y-intercept of 10. _____

21.) Find the value of r given:

a) (-2,r), (6,7), m=1/2 _____

b) (r, -6), (-2, -3), m = -8/5 _____

22.) Find the x and y intercepts for the equation: $2x - 5y = -10$. _____

Part 4. Word Problems

23.) In 2005, Which Wich sold 7,500 sandwiches. In 2012, they sold 14,500 sandwiches. What is the rate of change in the number of sandwiches sold?

_____

24.) In 2003 there were 40 deer in a park. By 2007, the population had grown to 92 deer in the park. Assuming that the number of deer in the park grow at a constant rate, how many deer would be in the park in 2016?

_____

25.) In 1997, there were 4 trees in an orchard. Each year the owner planted the same number of trees. Twenty-nine years later, there were 178 trees in the orchard. How many tree will there be 40 years from the start?

_____

26.) Write a linear equation in point-slope form to model the situation: A phone company charges $16.25 per month and a setup fee. The total cost for 6 months is $142.50.

_____

27.) Google Fibers charges $59.99 per month and a set-up fee. The set-up fee is $30.12.

a.) Write a linear equation in slope-intercept form to model the situation: _____

b.) What would be the total charge for using Google Fiber for one year? _____

28.) T-shirts at a flea market cost $4.50 each and shorts cost $6 each.

a.) Write an equation in standard form to model the situation: _____

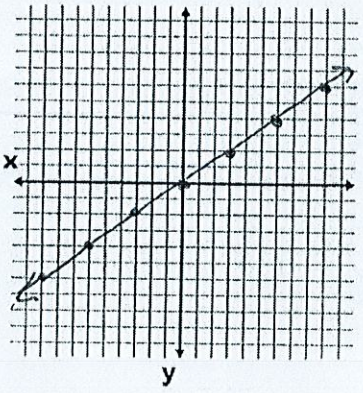
b.) If you have enough money to buy exactly 12 t-shirts and 9 pairs of shorts, then how much will you spend in total at the flea market on t-shirts and shorts?

_____

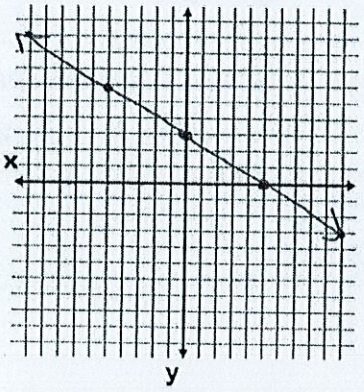
Linear Equations Study Guide Name: Key

Part 1. GRAPHING: Graph each equation on the coordinate plane provided.

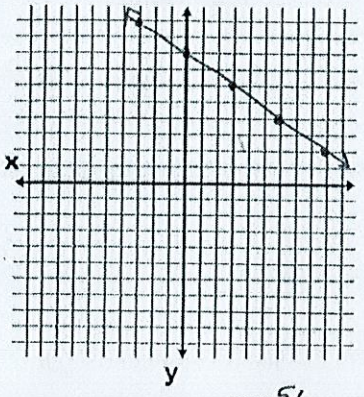
1.) $y = \frac{2}{3}x$.



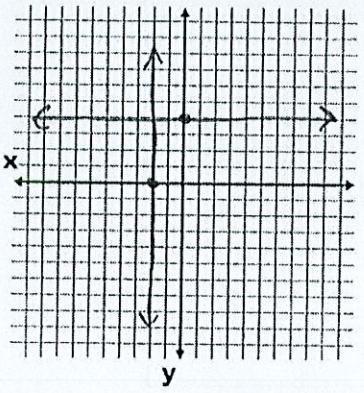
2.) $3x+5y=15$ $x=5$ $y=3$



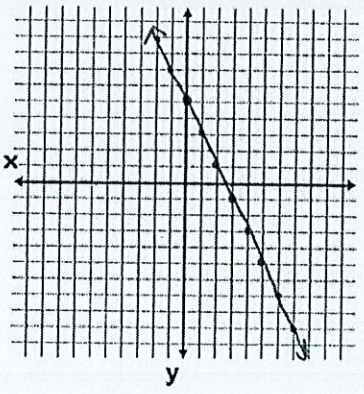
3.) $y-4=-\frac{2}{3}(x-6)$ $m=-2/3$ $(6,4)$



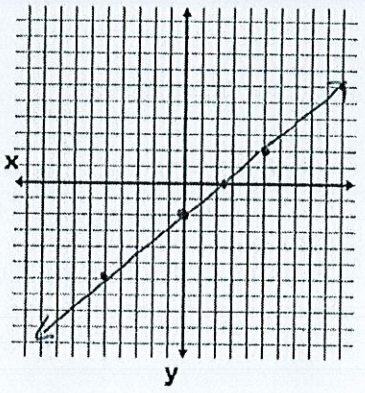
4.) y=4 &x= -2



5.) $y = -2x + 5$

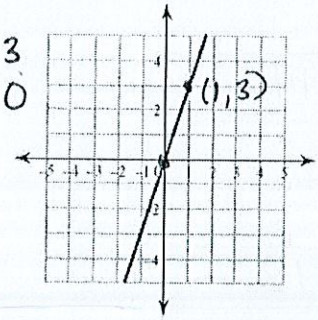


6.) $4x - 5y = 10$ $x=5/2$ $y=-2$



Give the equation for each graph below in ALL FORMS.

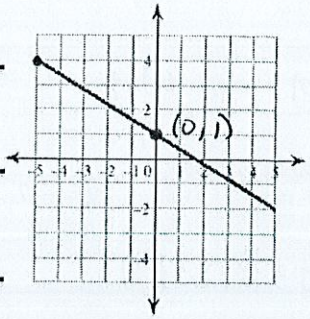
$m=3$
$b=0$



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

$y=3x$

$3x-y=0$



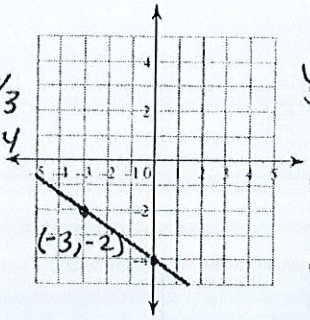
$y-1=-3/5(x-0)$

$y=-3/5x+1$

$3x+5y=5$

$m=-3/5$
$b=1$

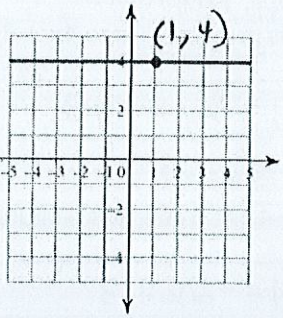
$m=-2/3$
$b=-4$



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

$y=-2/3x-4$

$2x+3y=-12$



$y-4=0(x-1)$

$y=4$

$y=4$

Part 2. ALL FORMS: Given the following information, write the equation in all the forms.

Point Slope	Slope Intercept	Standard Form

7.) passes through (4, 6) and (-2, 3) $m = \frac{3-6}{-2-4} = \frac{-3}{-6} = \frac{1}{2}$

$y-6=\frac{1}{2}(x-4)$	$y=\frac{1}{2}x+4$	$x-2y=-8$

8.) passes through (4, -2) and has a y-intercept of -3. $(0,-3)$ $m = \frac{-3+2}{0-4} = \frac{-1}{-4} = \frac{1}{4}$

$y+3=\frac{1}{4}(x-0)$	$y=\frac{1}{4}x-3$	$x-4y=12$

9.) slope is zero (horizontal) that passes through (3, -7).

$y+7=0(x-3)$	$y=-7$	$y=-7$

10.) slope $\frac{2}{5}$ and passes through (10, 0).

$y-0=\frac{2}{5}(x-10)$	$y=\frac{2}{5}x-4$	$2x-5y=20$

11.) slope is undefined (vertical) and passes through the point (-2, 5)

$x=-2$	$x=-2$	$x=-2$

12.) (-4,6)&(-3,8) $m = \frac{8-6}{-3+4} = \frac{2}{1}$

$y-6=2(x+4)$	$y=2x+14$	$2x-y=-14$

13.) line that passes through (-2, 6) and is parallel (same slope) to $3x - 2y = -7$. $m=\frac{3}{2}$

$y-6=\frac{3}{2}(x+2)$	$y=\frac{3}{2}x+9$	$3x-2y=-18$

14.) line that passes through (-12, 4) and is perpendicular (opp. reciprocal) to $4x + 3y = 8$. $m=-\frac{4}{3} \rightarrow \frac{3}{4}$

$y-4=\frac{3}{4}(x+12)$	$y=\frac{3}{4}x+13$	$3x-4y=-52$

15.) The line parallel (same slope) to the graph of $8x + 4y = 6$ and passes through the point (-2, 7). $m=\frac{-8}{4}=-2$

$y-7=-2(x+2)$	$y=-2x+3$	$2x+y=3$

16.) The line perpendicular to the graph of $9x - 3y = -12$ that passes through (6, 2).

opposite reciprocal $m = \frac{-9}{-3} = 3$ $m_{\perp} = \frac{-1}{3}$

$y - 2 = -\frac{1}{3}(x - 6)$	$y = -1/3x + 4$	$x + y = 12$

17.) $y - 9 = \frac{3}{4}(x + 6)$

$y - 9 = \frac{3}{4}(x + 6)$	$y = \frac{3}{4}x + \frac{27}{2}$	$3x - 4y = -54$

18.) $y = \frac{2}{3}x + 4$

$y - 4 = \frac{2}{3}(x - 0)$	$y = \frac{2}{3}x + 4$	$2x - 3y = -12$

Part 3. Mixed Practice

19.) What is the standard form of the equation of the line through (-7, 8) with slope 3/4? $3x - 4y = -53$

20.) Write the equation of the line in standard form with an x-intercept of -7 and a y-intercept of 10. $10x - 7y = -70$

(-7, 0) (0, 10)

21.) Find the value of r given:

a) (-2,r), (6,7), m=1/2 $\frac{7 - r}{6 + 2} = \frac{1}{2}$ $r = 3$

b) (r, -6), (-2, -3), m = -8/5 $\frac{-3 + 6}{-2 - r} = \frac{-8}{5}$ $r = -1/8$

22.) Find the x and y intercepts for the equation: $2x - 5y = -10$.

$x = -5$ $y = 2$

(-5, 0) (0, 2)

$x = -5$

$y = 2$

Part 4. Word Problems

23.) In 2005, Which Wich sold 7, 500 sandwiches. In 2012, they sold 14,500 sandwiches. What is the rate of change in the number of sandwiches sold?

x = # of years since 2005

y = # of sandwiches sold

(2005, 7500) x=0 y=7500

(2012, 14500) x=7 y=14500

$\frac{14500 - 7500}{7 - 0} = \frac{7000}{7} = 1000$ sand/year

1000 sandwiches per year

24.) In 2003 there were 40 deer in a park. By 2007, the population had grown to 92 deer in the park. Assuming that the number of deer in the park grow at a constant rate, how many deer would be in the park in 2016?

x = # of years since 2003

y = # of deer in park

(2003, 40) x=0 y=40

(2007, 92) x=4 y=92

$m = \frac{92 - 40}{4 - 0} = \frac{52}{4} = 13$

$y = 13x + 40$

$y = 13(13) + 40 = 209$

$x = 13$ $y = ?$

209 deer

25.) In 1997, there were 4 trees in an orchard. Each year the owner planted the same number of trees. Twenty-nine years later, there were 178 trees in the orchard. How many tree will there be 40 years from the start? $x = 40$ $y = ?$

x = # of years since 1997

y = # of trees in orchard

(1997, 4) x=0 y=4 → (0, 4) (29, 178)

$m = \frac{178 - 4}{29 - 0} = \frac{174}{29} = 6$

$y = 6x + 4$

$y = 6(40) + 4 = 244$

244 trees

x = # of months
y: cost

26.) Write a linear equation in point-slope form to model the situation: A phone company charges $16.25 per month and a setup fee. The total cost for 6 months is $142.50.

slope

y-intercept (x=0)

(6, 142.50)

$y - 142.50 = 16.25(x-6)$

27.) Google Fibers charges $59.99 per month and a set-up fee. The set-up fee is $30.12.

y slope x

y-intercept

a.) Write a linear equation in slope-intercept form to model the situation:

$y = 59.99x + 30.12$

b.) What would be the total charge for using Google Fiber for one year?

$750

$y = 59.99(12) + 30.12 = 750$

$x = 12$
$y = ?$

28.) T-shirts at a flea market cost $4.50 each and shorts cost $6 each.

x y

C = Total cost

a.) Write an equation in standard form to model the situation:

$4.50x + 6y = C$

b.) If you have enough money to buy exactly 12 t-shirts and 9 pairs of shorts, then how much will you spend in total at the flea market on t-shirts and shorts?

$4.50(12) + 6(9) = C$

$54 + 54 = C$

$108 = C$

$108