Name: _____ **Date:** _____

Practice Test Unit 3: Linear Equations and Inequalities

1) Which of the following is a linear equation:

1. $-3x + 2$
2. $-x + 7y = 12$
3. $x^3 + 5x + 2 = -3$
4. $x^2 + 2x + 4 = 4$

2) If $(k, 4)$ is a point on the graph of the equation $4x + 2y = 4$, what is the value of k?

1. 1
2. -1
3. 6
4. -6

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

3) Use the table below to find the x- and y-intercepts.

x	y
-2	-9
0	-6
2	-3
4	0

1. x-intercept: -6; y-intercept: 4
2. x-intercept: 4 ; y-intercept: -6
3. x-intercept: -6; y-intercept: -9
4. x-intercept: -2; y-intercept:-6

y intercept

x intercept

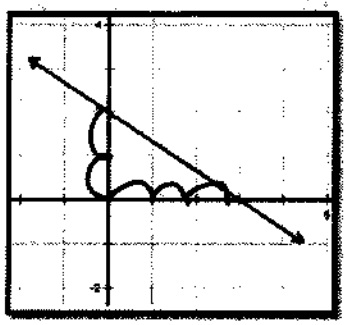
4) What is the slope of the line containing the points (3,4) and (-6,10)?

1. $\frac{1}{2}$
2. 2
3. $-\frac{2}{3}$
4. $-\frac{3}{2}$

x	y
3	4
-6	10

$\frac{6}{-9} = \frac{2}{3}$

5) Which equation is represented by the graph of line L?



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

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

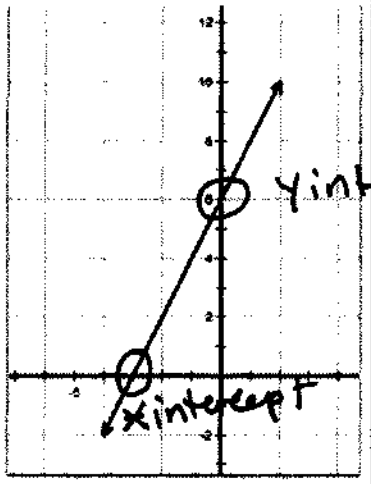
6) What is the y-intercept of the graph of the equation $y = -\frac{2}{3}x + 4$?

1. $-\frac{2}{3}$
2. -2
3. 3
4. 4

b

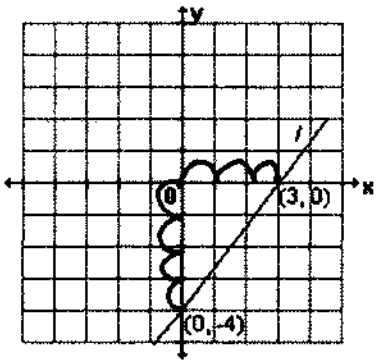
7) Use the graph below to find the x-and y-intercepts.

1. x-intercept: 2; y-intercept: 6
2. x-intercept: –3 ; y-intercept: 6
3. x-intercept: 2; y-intercept: –3
4. x-intercept: 6; y-intercept: 2



6) What is the slope of line l shown in the accompanying diagram?

1. $\frac{4}{3}$
2. $-\frac{3}{4}$
3. $\frac{3}{4}$
4. $-\frac{4}{3}$



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

7) If x and y are defined as indicated by the accompanying table, which equation correctly represents the relationship between x and y?

1. $y = x + 2$
2. $y = 2x + 2$
3. $y = 2x + 3$
4. $y = 2x - 3$

x	y
2	1
3	3
5	7
7	11

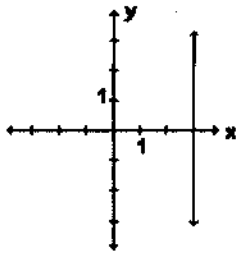
$1 = 2(2) + b$
$1 = 4 + b$
$-4 \quad -4$
$b = -3$

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

$y = 2x - 3$

8) Which graph represents the equation $Y = 3$?

1.



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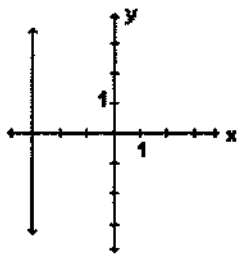

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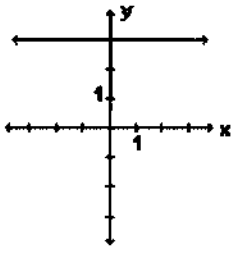

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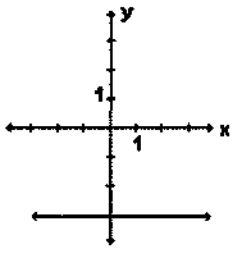


*brownie y cost

10) Maddi bought 3 brownies for 4 dollars. which of the following statements is true:

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

1. The independent variable is the cost in dollars, the dependent variable is number of brownies, and the slope is $\frac{4}{3}$
2. The independent variable is the number of brownies, the dependent variable is cost in dollars, and the slope is $\frac{3}{4}$
3. The independent variable is the cost in dollars, the dependent variable is number of brownies, and the slope is $\frac{3}{4}$
4. The independent variable is the number of brownies, the dependent variable is cost in dollars, and the slope is $\frac{4}{3}$

Extended Response Questions:

11) Find the x intercept and the y-intercept of the following equation algebraically:

$4x - 2y = 16$

x-intercept $y=0$

$4x - 2(0) = 16$

$\frac{4x}{4} = \frac{16}{4}$

$x = 4$

y-intercept $x=0$

$4(0) - 2y = 16$

$\frac{-2y}{-2} = \frac{16}{-2}$

$y = -8$

12) Answer the following questions based on the linear equation

$5y + 3x = 15$

$-3x \quad -3x$

a. Rearrange the following standard form linear equation in the slope-y-intercept form

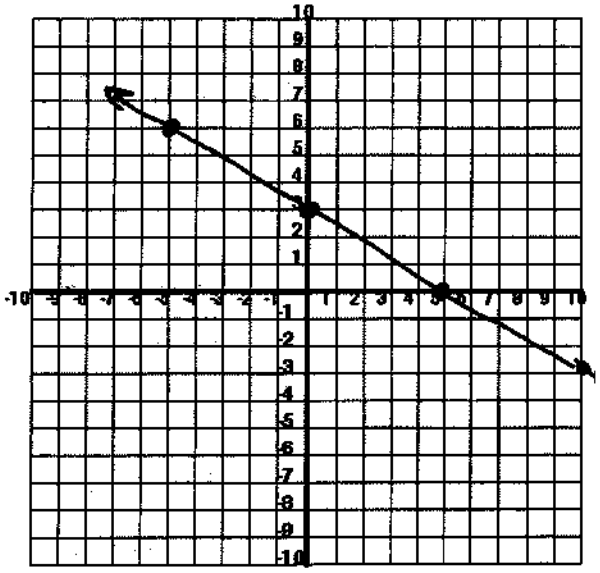
$\frac{5y}{5} = \frac{-3x}{5} + \frac{15}{5}$

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

b. Complete the table:

x	y
-5	6
0	3
5	0
10	-3

c. Graph the linear equation



d. What is the value of x when $y = -3$?

$x = 10$

e. Identify the intercepts

x-intercept = 5

y intercept = 3

$b=2$ $m=2$

13) Before beginning voice lessons, Johnny already knew how to sing 2 pieces, and he expects to learn 2 new pieces during each week of lessons.

a. Write an equation that shows the relationship between the number of weeks w and the number of pieces learned p.

$P = 2w + 2$

b. Identify the parameters, and what they mean in the context of the situation.

2 is the intial number of pieces that Johnny knew
2 is the number of pieces that Johnny learns each week

c. How many weeks does it take Johnny to learn 16 pieces?

$16 = 2w + 2$
$-2 \quad -2$
$\frac{14}{2} = \frac{2w}{2}$ $w = 7$ weeks

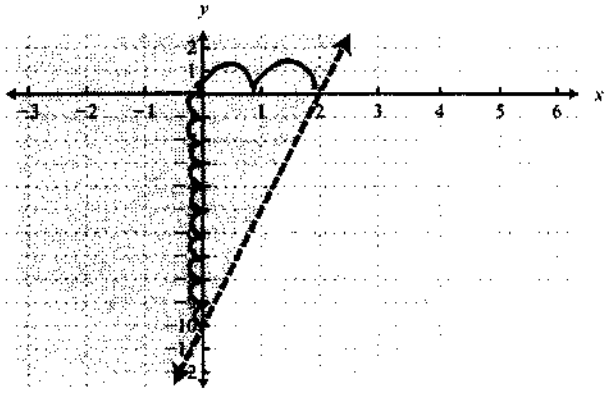
d. How many pieces will Johnny learn by the third week?

$P = 2(3) + 2$
$P = 6 + 2$
$P = 8$ pieces.

14) Write the linear inequality for the half plane:

$b = -10$ $m = \frac{10}{2} = 5$

$y > 5x - 10$



15) The Sparrow town High School science department can spend less than $4,700 on textbooks this year. The department needs to buy both Biology textbooks(x), which cost $97 apiece, and Chemistry textbooks(y), which cost $60 apiece.

a. Write a linear inequality to describe this situation.

$97x + 60y < 4700$

b. What is the maximum number of biology text books that can be purchased if 20 Chemistry books are purchased?

$97x + 60(20) < 4700$
$97x + 1200 < 4700$
$-1200 \quad -1200$
$\frac{97x}{97} < \frac{3500}{97}$
$x < 36.08$

36 biology Books

c. Can the department purchase 15 chemistry text books and 12 biology text books without being over budget?

$97(12) + 60(15) < 4700$
$1164 + 900 < 4700$
$2064 < 4700$

Yes. The cost will be $2064 which is less than the budget

16) Answer the following questions based on the inequality:

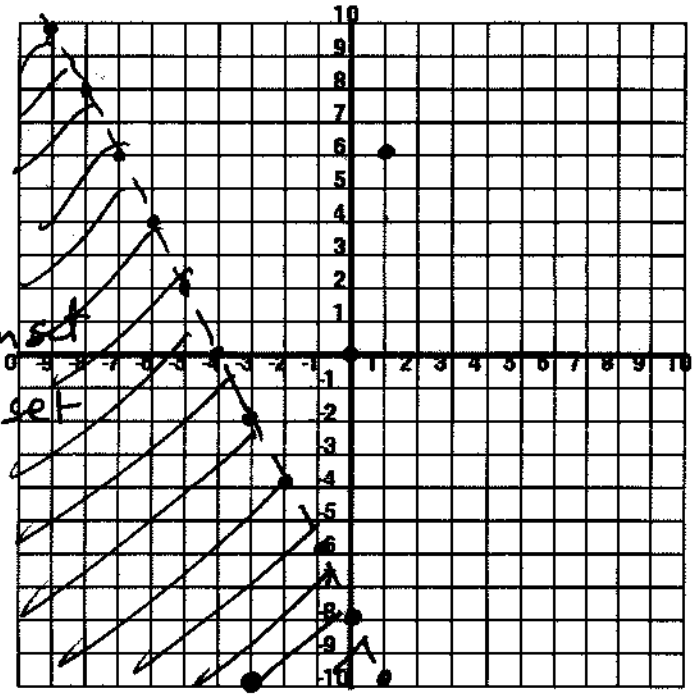
$-3y - 6x > 24$ $+6x$ $+6x$

a. Rearrange the following inequality in the slope-y intercept

$\frac{-3y}{-3} > \frac{6x}{-3} + \frac{24}{-3}$

$y < -2x - 8$

b. Graph the half-plane for the inequality



c. Determine if the following points are solutions in the half plane

A (1,6) NO Not in the solution set

B (0,0) No Not in the solution set

C (-3,-10) Yes in the half plane

Answer the following review questions to study for the test

17) Find the sum of $3x^2 + 5x - 1$ and $x^2 - 2x - 7$

$4x^2 + 3x - 8$

1. $2x^2 - 7x - 6$
2. $-2x^2 - 7x + 6$
3. $4x^2 - 3x + 8$
4. $4x^2 + 3x - 8$

18) From $5x^2 - 6x + 8$, subtract $3x^2 - 2x - 4$.

$5x^2 - 6x + 8 - (3x^2 - 2x - 4)$

$5x^2 - 6x + 8 - 3x^2 + 2x + 4$

$2x^2 - 4x + 12$

1. $2x^2 + 6x - 12$
2. $2x^2 - 6x + 12$
3. $-2x^2 + 4x - 12$
4. $2x^2 - 4x + 12$

19) What is the product of $3y^2$ and $4y^5$?

$3(4) = 12$

$y^2(y^5) = y^7$

1. $7y^{10}$
2. $12y^{10}$
3. $7y^7$
4. $12y^7$

20) Express $(4x - 5)(6x + 5)$ as a trinomial.

$24x^2 + 20x - 30x - 25$

$24x^2 - 10x - 25$

1. $24x^2 - 10x - 25$
2. $24x^2 - 50x - 25$
3. $24x^2 - 25$
4. $-24x^2 + 25$

21) What is the value of x in the equation $13x - 2(x + 4) = 8x + 1$?

1. 1
2. 3
3. 2
4. 4

$13x - 2x - 8 = 8x + 1$

$11x - 8 = 8x + 1$

$-8x \quad -8x$

22) Solve for x in terms of a, b, and c: $ax - 3b = c$

1. $a(c + 3b)$
2. $\frac{c - 3b}{a}$
3. $a(c - 3b)$
4. $\frac{c + 3b}{a}$

$+3b \quad +3b$

$\frac{ax}{a} = \frac{c + 3b}{a}$

$x = \frac{c + 3b}{a}$

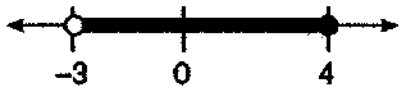
$3x - 8 = 1$

$+8 \quad +8$

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

$x = 3$

23) Which inequality is represented in the accompanying graph?



1. $-3 \leq x < 4$
2. $-3 \leq x \leq 4$
3. $-3 < x < 4$
4. $-3 < x \leq 4$

24) Which value of x is in the solution set of the inequality $-2x + 5 > 17$?

1. -8
2. -4
3. -6
4. 12

$-5 \quad -5$

$\frac{-2x}{-2} > \frac{12}{-2}$

$x < -6$

25) Choose the expression that mathematically represents 5 times a number less than 7.

1. $7 - 5x$
2. $7 - 5 + x$
3. $5 + y - 7$
4. $5x - 7$

$7 - 5x$

26) $(x + y) + z = x + (y + z)$ is an example of the which property

1. Associative
2. Commutative
3. Distributive
4. Multiplicative property of equality

27) Simplify $(x - 2)^2$

$(x-2)(x-2)$

$x^2 - 2x - 2x + 4$

$x^2 - 4x + 4$