Algebra 2
1st Quarter Review

Name _____
Date _____ **Period** _____

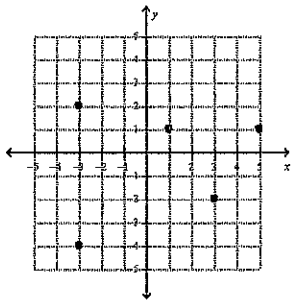
State the domain and range of following:

1. {(-4,1),(-1,-2),(0,-5),(9,6)}

Domain: -4, -1, 0, 9

Range: -5, -2, 1, 6

2.



Domain: -3, 1, 3, 5

Range: -4, -2, 1, 2

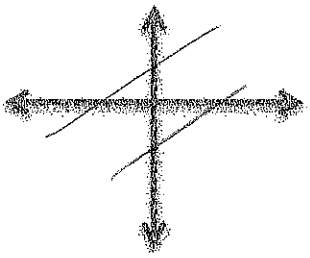
3. $y = 5x + 18$

Domain: $(-\infty, \infty)$

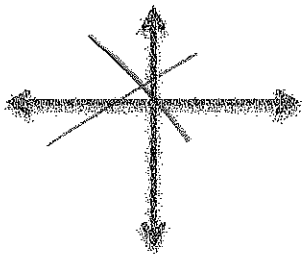
Range: $(-\infty, \infty)$

For problems 4-6, sketch a system of linear equations with:

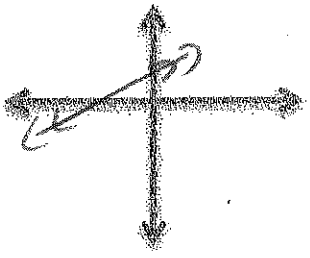
4. NO SOLUTIONS



5. ONE SOLUTION



6. INFINITELY MANY SOL'S



7. Using linear regression, find the line of best fit. Use this regression equation to predict the function value that would replace the question mark. Round your answer to the same number of decimal places used for the given data in the table.

A.

x	3	6	8	9	11	15
f(x)	30.5	65.8	85.1	93.4	111.7	?

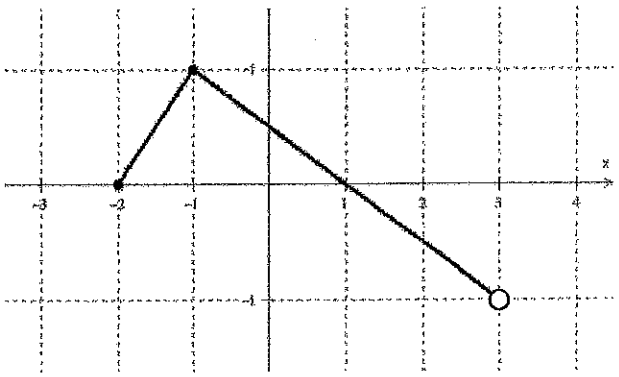
$y = 10.12 + 2.44 = 154.2$

B.

x	25	30	35	40	45	50
f(x)	3	7	13	19	20	?

$y = .92x - 19.8 = 26.2$

8. State the domain and range for the graph to the right.



Domain: $[-2, 3)$ $-2 \leq x < 3$

Range: $(-1, 1]$ $-1 < y \leq 1$

9. Given: $f(x)=x+1$ $y = x + 1$ $m = \frac{1}{1}$ $b = 1$

A) Sketch the graph of f(x).

Sketch the graph of $f^{-1}(x)$.

Write the equation of $f^{-1}(x)$

Original

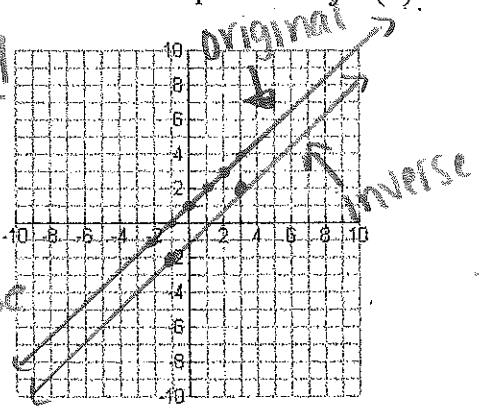
(-2, -1)

(2, 3)

Inverse

(-1, -2)

(3, 2)



$x = y + 1$

$-1 \quad -1$

$x - 1 = y$

$y = x - 1$

Inverse

$g(x)=\frac{1}{2}x-6$ $y = \frac{1}{2}x - 6$ $m = \frac{1}{2}$ $b = -6$

Sketch the graph of g(x).

Sketch the graph of $g^{-1}(x)$.

Write the equation of $g^{-1}(x)$

Original

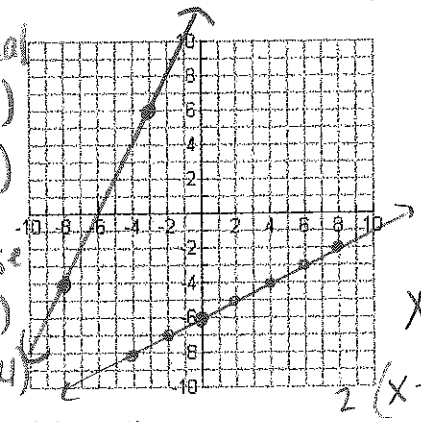
(6, -3)

(-4, -8)

Inverse

(-3, 6)

(-8, -4)



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

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

$2x + 12 = y$

#9B

10. Find the slope of the line passing through the points (3, -8) and (-5, -1).

$x_1, y_1 \quad x_2, y_2$

$m = \frac{-1 - -8}{-5 - 3} = \frac{7}{-8} = \boxed{\frac{-7}{8}}$

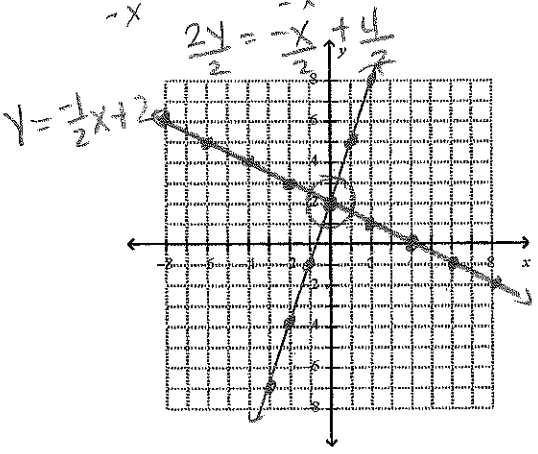
11. Solve the following systems of equations by graphing. Sketch their graphs and point of intersection below.

$x + 2y = 4$ $\quad y = 3x + 2$

$-x \quad -x$

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

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



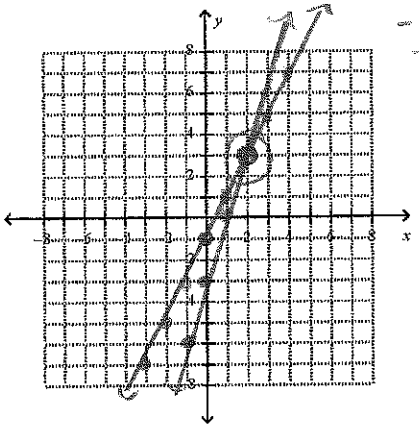
SOLUTION: (0, 2)

$y = 3x - 3$ $\quad 2x - y = 1$

$-2x \quad -2x$

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

$y = 2x - 1$



SOLUTION: (2, 3)

12. Solve by substitution:

$x - y = 1$ $\quad +y \quad +y$

$2x + 3y = 12$

$x = y + 1$

$2(y + 1) + 3y = 12$

$2y + 2 + 3y = 12$

$-2 \quad -2$

$\frac{5y}{5} = \frac{10}{5}$

$y = 2$

$x = 2 + 1$

$x = 3$

$x - 3y = 16$ $\quad +3y \quad +3y$

$4x - y = 9$

$4(3y + 16) - y = 9$

$12y + 64 - y = 9$

$-64 \quad -64$

$\frac{11y}{11} = \frac{-55}{11}$

$y = -5$

$x = 3y + 16$

$x = 3(-5) + 16$

$x = -15 + 16$

$x = 1$

$y = -5$

$y = 3x - 2$

13. Solve by elimination:

$2x - y = 17$
$3x + y = 8$

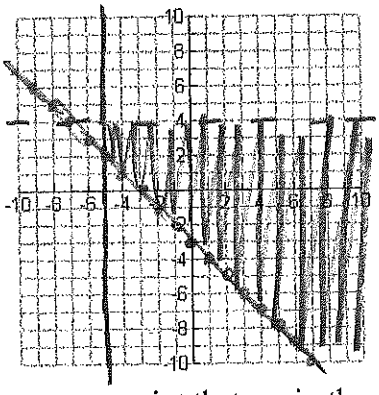
$5x = 25$, $x = 5$

$3(5) + y = 8$
$15 + y = 8$
$-15 \quad -15$
$y = -7$

$-1(3x - 2y = 2) \rightarrow -3x + 2y = -2$
$3x + 4y = 50 \rightarrow 3x + 4y = 50$
$6y = 48$, $y = 8$

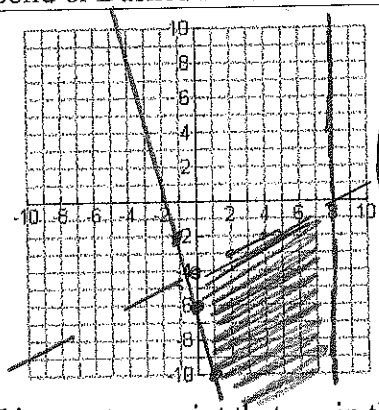
$3x + 4(8) = 50$
$3x + 32 = 50$
$3x = 18$
$x = 6$

14. Graph the following system of inequalities: (Solid or Dashed line? Shade above or below?)



$y < 4$
$y + 2 < 6$
$x \geq -5$
$x + y \geq -3$
$y \geq -x - 3$

List any two point that are in the solution set:



$-x \quad -x$
$x - 2y > 8$
$x \leq 8$
$4x + y \geq -6$
$y \geq -4x - 6$

$\frac{-2y}{-2} > \frac{-x}{-2} + \frac{8}{-2}$
$y < \frac{1}{2}x - 4$

List any two point that are in the solution set:

15. Set up a matrix equation and solve using matrices on your calculator.

$\frac{1}{2}x + 3y = 11$
$8x - 5y = 17$

$\begin{bmatrix} \frac{1}{2} & 3 \\ 8 & -5 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 11 \\ 17 \end{bmatrix}$ $x = 4$, $y = 3$

$8x + 3y = -5$
$10x + 6y = -13$

$\begin{bmatrix} 8 & 3 \\ 10 & 6 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 13 \end{bmatrix}$ $x = \frac{1}{2}$, $y = -3$

$3x - 2y + z = 1$
$y = 2 + x + z$
$5x + 2y + 10z = 39$

$\begin{bmatrix} 3 & -2 & 1 \\ -1 & 1 & -1 \\ 5 & 2 & 10 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 39 \end{bmatrix}$ $x = 5$, $y = 7$, $z = 0$

$x = 3 - y - z$
$13x + 2z = 2$
$-x - 5z = -5$

$\begin{bmatrix} 1 & 1 & 1 \\ 13 & 0 & 2 \\ -1 & 0 & -5 \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 2 \\ -5 \end{bmatrix}$ $x = 0$, $y = 2$, $z = 1$

Solve using any method: $\begin{bmatrix} 1 & 1 \\ .05 & .10 \end{bmatrix}\begin{bmatrix} n \\ d \end{bmatrix} = \begin{bmatrix} 42 \\ 3.15 \end{bmatrix}$

16. In the cushion of the couch, you find 42 coins, all nickels and dimes, totaling $3.15. How many of each coin do you have?

$n + d = 42$
$.05n + .10d = 3.15$

$d = 42 - n$
$.05n + .10(42 - n) = 3.15$
$.05n + 4.2 - .10n = 3.15$
$-4.2 \quad -4.2$
$-.05n = -.95$
$\frac{-.05n}{-.05} = \frac{-.95}{-.05}$

$n = 19$ nickels
$d = 23$ dimes

17. The theatre department sold 400 matinee tickets and 280 evening tickets to their last show. The matinee tickets were $7 less than the evening tickets, and they made a total of $7400 in ticket sales. How much did each type of ticket cost?

$400m + 280e = 7400$
$m = e - 7$

$m = 15 - 7$
$m = 8$

$400(e - 7) + 280e = 7400$
$400e - 2800 + 280e = 7400$
$+2800 \quad +2800$
$\frac{680e}{680} = \frac{10200}{680}$
$e = 15$

18. The perimeter of a rectangle is 96 inches. The length of the rectangle is 6 inches less than twice the width. Find the dimensions of the rectangle.

$2l + 2w = 96$

$l = 2w - 6$

$2(2w-6)+2w=96$

$4w - 12 + 2w = 96$

$+12 \quad +12$

$\frac{6w}{6} = \frac{108}{6}$

$w = 18$

$l = 2(18) - 6$

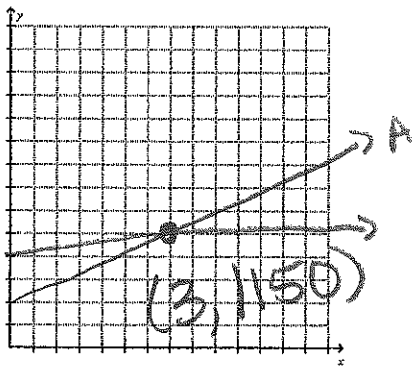
$l = 16 - 6$

$l = 10$

19. Chris bought both regular and king sized candy bars for Halloween. Regular sized candy bars cost \$1 while king sized candy bars cost \$3. Chris can only spend \$20 on candy. Write an inequality to model this situation.

$1x + 3y \leq 20$

20. The student council needs to rent a building for Prom. Building A requires a \$250 fee plus \$300 per hour. Building B requires a \$400 fee plus \$250 per hour. Graph the system of equations on the graph below then answer the questions below the graph.



a) How many hours of rental would result in the cost of the two buildings to be equal?

3 hrs

b) What is the cost at the time they are equal?

\$1150

c) For how many hours of rental would it be cheaper to rent Building A?

0 - 3 hrs

d) For how many hours of rental would it be cheaper to rent Building B?

3 - ∞ hrs

Parent

21. The vertex of an absolute value graph is at (0 , 0). The graph is shaped like a V.

22. How do the graphs of $f(x)=|x|$ and $t(x)=5|x|$ compare?

$t(x) = 5|x|$ is narrower

23. How do the graphs of $f(x)=|x+4|$ and $f(x)=|x|+4$ compare?

24. Graph the 2 absolute value functions from #23on the same graph, using 2 different colored pencils.