Honors Math 3 HW 1-1 Name

Solve each linear equation. MUST SHOW WORK ON NOTEBOOK PAPER!

1) $7w + 2 = 3w + 30$

2) $2 - 3(x + 4) = 8$

3) $6x - 12 + 2x = 3 + 8x - 15$

4) $\frac{3b-4}{4b+1} = \frac{2}{3}$

5) $7(a + 1) - 3a = 5 + 4(2a - 1)$

6) $4(w - 1) + 3 = 4w - (w + 1)$

II. **Solve for y. Then identify the slope and y intercept.**

7) $2x + 5y = 10$

8) $3x - y = 5$

9) $5x - 3y = 15$

III. **Evaluate the following for the given values.**

10) Given $f(x) = 4x - 7$. Find

a. f (2)

b. f (-3)

11) Given $m(x) = 4x^2 - 5$

a. m (3)

b. m (-1)

12. Given: $p(x) = -3x^2 + 2x + 1$

a. p(2)

b. p(-3)

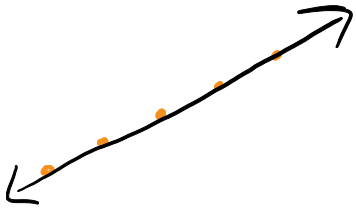
IV. **Graph the following lines.**

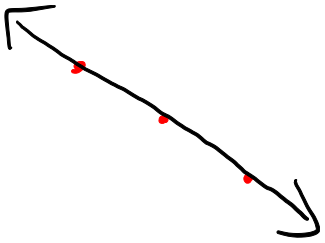
IV. Gra h each of the foll uations.

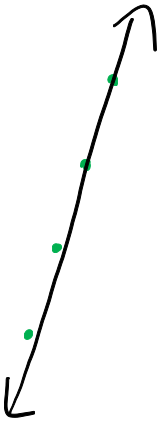
13) $y = \frac{1}{2}x - 3$

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

15) $y = 3x - 1$



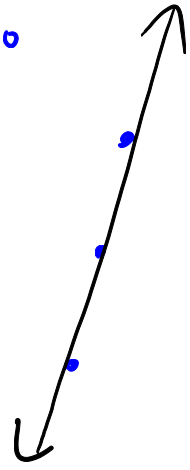


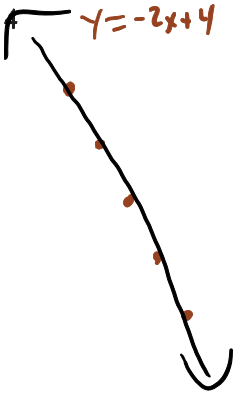


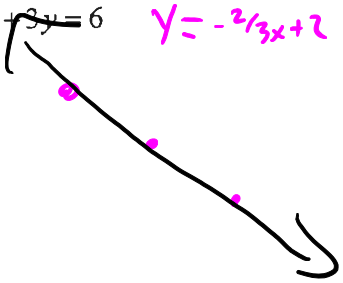
16) $y = 4x + 0$

17) $2x + y =$

18) $2x + 3y = 6$







Name Class Date

1-2 Homework

Systems of Equations with Context

Solve G

$3x - 6y = 12$ $y = \frac{1}{2}x - 2$

$2x - 4y = 8$ $y = \frac{1}{2}x - 2$

∞ solutions

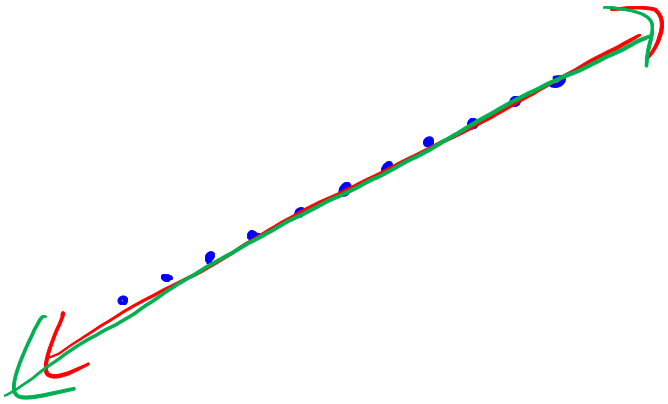
$x + y = 2$

$y = -2x - 1$

$y = -x + 2$

$y = -2x - 1$

(-3, 5)



Solve Substitution.

$2x - y = -1$

$y = x - 1$

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

$2x - 3x + 3 = -1$

$-x = -4$

$x = 4$

$y = 4 - 1$

$y = 3$

(4, 3)

$y = -3x + 5$

$5x - 4y = -3$

$5x - 4(-3x + 5) = -3$

$5x + 12x - 20 = -3$

$17x = 17$

$x = 1$

$y = -3(1) + 5$

$y = 2$

(1, 2)

Solve Elimination.

$-2(5x + y = 9)$

$10x - 7y = -18$

$-10x - 2y = -18$

$10x - 7y = -18$

$-9y = -36$

$y = 4$

$5x + 4 = 9$

$5x = 5$

$x = 1$

(1, 4)

$-3(-3x + 7y = -16)$

$-9x + 5y = 16$

$9x - 21y = 48$

$-9x + 5y = 16$

$-16y = 64$

$y = -4$

$-3x + 7(-4) = -16$

$-3x - 28 = -16$

$-3x = 12$

$x = -4$

(-4, -4)

For each question, define your variables, write a system of equations, and solve using any method. Please use a separate sheet of paper to show all work.

1. The length of a rectangle is 3 cm more than twice the width. The perimeter of the rectangle is 42 cm. Find the dimensions of the rectangle.

L: length
w: width

$L = 2w+3$
$2L+2w=42$
$4w+6+2w=42$
$6w=36$
$w=6$
$2(6)+3$
$L=15$
15cm by 6cm

2. Suppose you have $200 in your account and you save $10 dollars each week. Your friend has $110 in their account and starts saving $15 each week. When will your account balances be the same?

$200+10x=110+15x$
$90=5x$
$x=18$ weeks

3. The difference of two numbers is 40. Their sum is 66. Find the numbers.

$x-y=40$
$x+y=66$
$2x=106$
$x=53$
$y=13$

4. A youth group and their leaders visited Mammoth Cave. Two adults and 5 students in one van paid $77. Two adults and 7 students in another van paid $95. Find the adult price and student price of the tour.

x student
y adult

$2y+5x=77$
$-2y+7x=95$
$-2x=-18$
$x=\$9$
$2y+45=77$
$2y=32$
$y=\$16$

5. A winter clothing store had a sale and Cory bought two pairs of gloves and four hats for $43. Mark bought two pairs of gloves and two hats for $30. How much did each pair of gloves and each hat cost?

x glove
y hat

$2x+4y=43$
$-2x+2y=30$
$4y=13$
$y=\$6.50$
$2x+26=43$
$2x=17$
$x=\$8.50$

6. At a recreation and sports facility, 3 members and 3 nonmembers pay a total of $180 to take a yoga class. A group of 5 members and 3 nonmembers pay $210 to take the same class. How much does it cost each member and nonmember to take the yoga class?

x: member
y: nonmember

$3x+3y=180$
$-5x+3y=210$
$-2x=-30$
$x=\$15$
$45+3y=180$
$3y=135$
$y=\$45$

7. Joey has $5.75 made up of all dimes and quarters. If Joey has 38 coins, how many of each coin does he have?

$10d+25q=575$
$d+q=38$
$10d+25q=575$
$-10d-10q=-380$
$15q=195$
$q=13$
$d=25$

Name Class Date

1 3 Homework

Linear Inequalities with Context

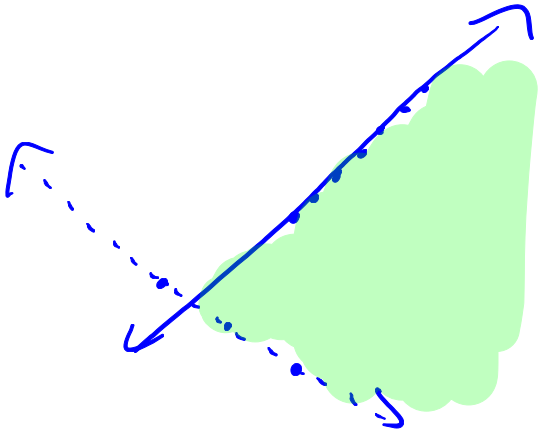
Solve the of ualities.

$2x+3y>-9$

$-x+y\le 4$

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

$y \le x+4$

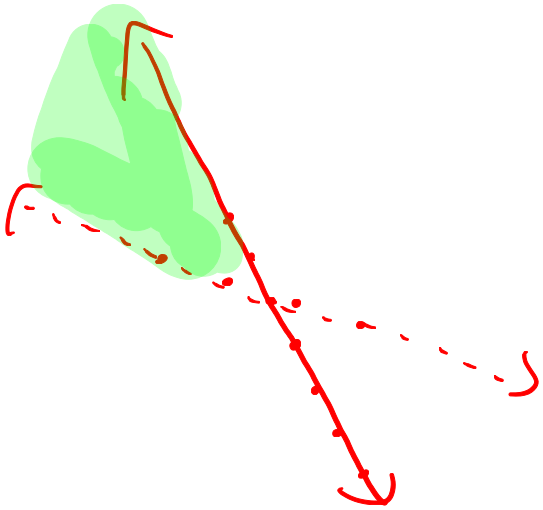


$4x+2y\le -8$

$-x-3y<6$

$y \le -2x - 4$

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



$f(x)>2x^2-6x-7$

$4x+f(x)\le 10$

$2-4-7$

$8-12-7$

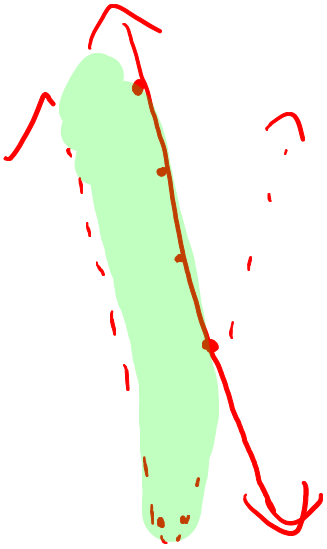
$f(x) \le -4x+10$

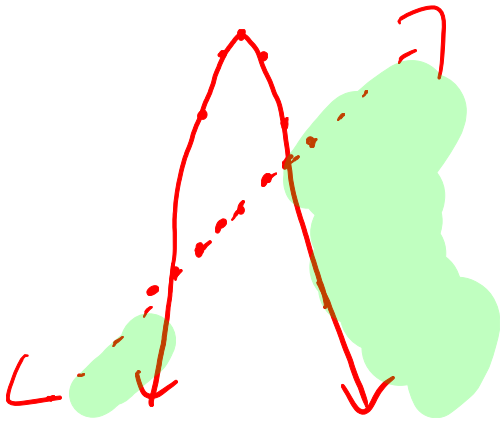
$-(x-2)^2+7\le y$

$-2x+2y<-6$

$y \ge x-3$

****Try to graph the quadratic function without a calculator.****

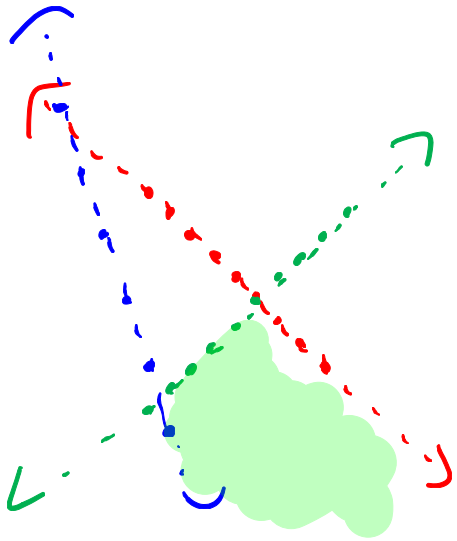




$y < -x + 4$

$y < x - 6$

$y > -3x - 4$



A sundae requires 3 ice-cream scoops and 4 strawberries, and a milkshake requires 2 ice-cream scoops and 6 strawberries. Ramses wants to make sundaes and milkshakes with at most 25 ice-cream scoops and 37 strawberries. Let's form a system of inequalities to represent his conditions. Let x denote the number of sundaes he makes and y the number of milkshakes he makes. Graph your solution on the following graph.

$3x + 2y \leq 25$

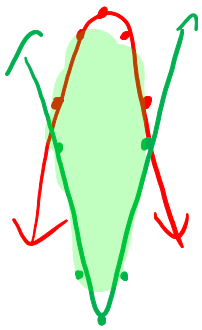
$4x + 6y \leq 37$

$y \leq -\frac{3}{2}x + 12.5$

$y \leq -\frac{2}{3}x + 6\frac{1}{6}$

$f(x) \leq -(x+3)^2 + 8$

$f(x) \geq 2(x+3)^2 - 6$



For a person of height h (in inches), a healthy weight W (in pounds) is one that satisfies this system of inequalities:

$$w \geq \frac{19h^2}{703}$$

$$w \leq \frac{25h^2}{703}$$

Graph the system for $0 \leq h \leq 80$ using your graphing calculator. What is the range of healthy weights for a person 67 inches tall?

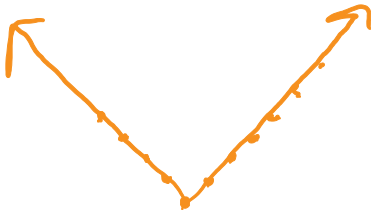
Name Class Date

Homework

Absolute Value Functions

Graph the following absolute value functions. Identify the vertex as well as the domain and of each function.

$y = |x-3|+2$

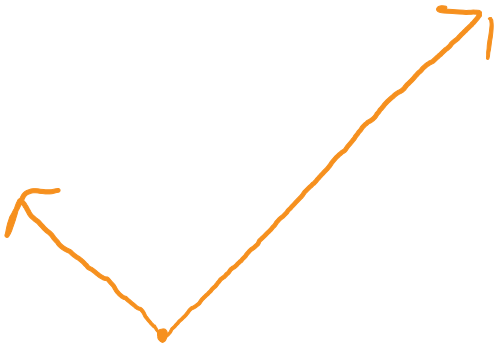


Vertex: $(3,2)$

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

Range: $[2, \infty)$

$y = |x+5|-4$

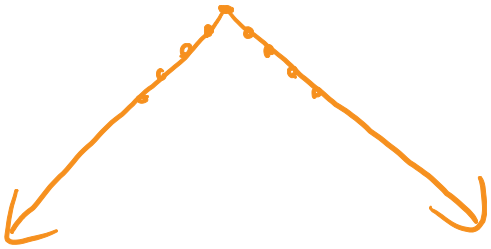


Vertex: $(-5,4)$

Domain: $(-\infty \infty)$

Range: $[-4, \infty)$

$y = -|x+2|+3$

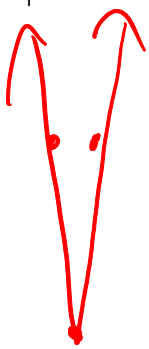


Vertex: $(-2,3)$

Domain: $(-\infty \infty)$

Range $(-\infty, 3]$

$y = 3|3x+6|-3$



Vertex: $(-2,-3)$

Domain: $(-\infty \infty)$

Range $[-3, \infty)$

Given the following functions, state the transformations from the absolute value parent function.

$y=|x-2|+4$ R 2, U 4

$y=|x+2|-4$ L 2, D 4

$y=-|x|-6$ Reflect x-axis D 6

$y=4|x+6|-3$ Vert stretch 4 L 6 D 3

$y=\frac{1}{3}|x-7|+8$ Vert shrink 1/3 R 7 U 8

$y=-4|x+8|-1$ Reflect x-axis | Vert stretch 4 | L 8 D 1

Transformation Review: For each of the following functions, state the parent function following by the type of transformation that has occurred. Please record your responses in boxes.

Function	Parent Function	Transformation
$y=x+4$	linear $y=x$	up 4 Same as left 4
$y=-(x-2)^2+6$	quadratic $y=x^2$	R 2 U 6 Reflect x-axis
$y=\frac{1}{2}(x+2)^3-6$	cubic $y=x^3$	L 2 D 6 Vert shrink 1/2
$y=2\sqrt{x-4}+6$	Square root $y=\sqrt{x}$	Vert stretch 2 Right 4 Up 6
$y=\sqrt[3]{x}+7$	cube root $y=\sqrt[3]{x}$	Up 7
$y=\frac{1}{x}-8$ $\left[\frac{1}{x+4}-8\right]$	reciprocal $y=\frac{1}{x}$	down 8

HW 1-4 B

Directions: Solve each inequality on a separate piece of paper. Show all work.

1. $|6b-3|=21$

2. $|-2m+7|=1$

3. $|b-2|=11$

4. $5|9-p=15$

5. $|10x+10|-2=78$

6. $|6x-6|+5=59$

7. $|4x+8|>40$

8. $|-2x+8|>6$

9. $|-4n+2|<2$

10. $4-a<6$

11. $-2|-2p-8|\geq -56$

12. $9\ 9+3x\leq 81$

13. $-3n+6\ -9>15$

Name Class Date

Homework

1 6 Piecewise Functions

Evaluate the function for the given value of x.

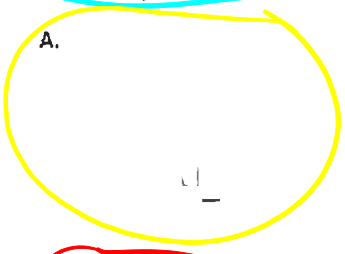
$f(x) = \begin{cases} 3, & \text{if } x \le 0 \\ 2, & \text{if } x > 0 \end{cases}$ $g(x) = \begin{cases} x + 5, & \text{if } x \le 3 \\ 2x - 1, & \text{if } x > 3 \end{cases}$ $h(x) = \begin{cases} \frac{1}{2}x - 4, & \le -2 \\ 3 - 2x, & > -2 \end{cases}$

1. $f(2) = 2$
2. $f(-4) = 3$
3. $f(0) = 3$
4. $f\left(\frac{1}{2}\right) = 2$
5. $g(7) = 13$
6. $g(0) = 5$
7. $g(-1) = 4$
8. $g(3) = 8$
9. $h(-4) = -6$
10. $h(-2) = -5$
11. $h(-1) = 5$
12. $h(6) = -9$

Match the piecewise function with its graph.

13. $f(x) = \begin{cases} x - 4, & \text{if } x \le 1 \\ 3x, & \text{if } x > 1 \end{cases}$
14. $f(x) = \begin{cases} x + 4, & \text{if } x \le 0 \\ 2x + 4, & \text{if } x > 0 \end{cases}$
15. $f(x) = \begin{cases} 3x - 2, & \text{if } x \le 1 \\ x + 2, & \text{if } x > 1 \end{cases}$
16. $f(x) = \begin{cases} 2x + 3, & \text{if } x \ge 0 \\ x + 4, & \text{if } x < 0 \end{cases}$
17. $f(x) = \begin{cases} 3x - 1, & \text{if } x \ge -1 \\ -5, & \text{if } x < -1 \end{cases}$
18. $f(x) = \begin{cases} -3x - 1, & \text{if } x \le 1 \\ -5, & \text{if } x > 1 \end{cases}$

A.



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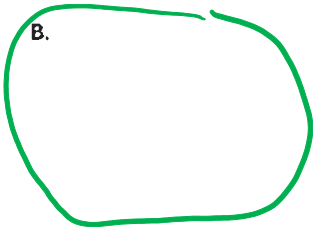
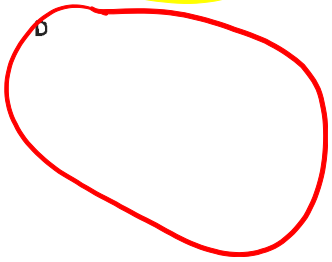
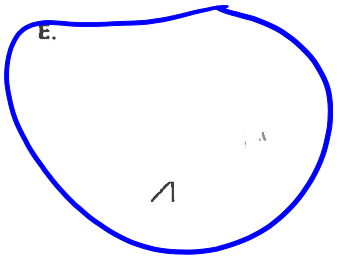


C.

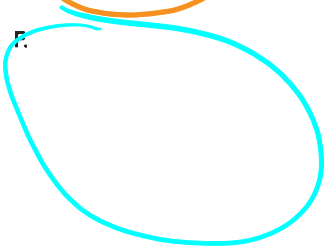
D.



E.



F.



Graph the function.

19. $f(x) = \begin{cases} x + 3, & \text{if } x \le 0 \\ 2x, & \text{if } x > 0 \end{cases}$

20. $f(x) = \begin{cases} x + 1, & \text{if } x < 0 \\ -x + 1, & \text{if } 0 \le x \le 2 \\ x - 1, & \text{if } x > 2 \end{cases}$

21. $f(x) = \begin{cases} 2, & \text{if } x \le -3 \\ -1, & \text{if } -3 < x < 3 \\ 3, & \text{if } x \ge 3 \end{cases}$

22. The admission rates at an amusement park are as follows.

Children 5 years old and under: free
Children between 5 years and 12 years, inclusive: $10.00
Children between 12 years and 18 years, inclusive: $25.00
Adults: $35.00

a) Write a piecewise function that gives the admission price for a given age.
b) Graph the function.

$f(x) = \begin{cases} 0 & \text{if } x \le 5 \\ 10 & \text{if } 5 < x \le 12 \\ 25 & \text{if } 12 < x \le 18 \\ 35 & \text{if } x > 18 \end{cases}$

Name Class Date

1-7 Homework

Introduction to Inverse Functions

1) Graph the inverse of the function shown below and find the inverse points.

Find the al inverse for each of the

a) $f(x) = 15x - 1$

$y = 15x - 1$

$x = 15y - 1$

$\frac{x+1}{15} = y$

$y = \frac{x+1}{15}$

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

$x = \sqrt{y-3} + 2$

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

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

c) $f(x) = (x-2)^2$

$x = (y-2)^2$

$\sqrt{x} + 2 = y$

$y = \sqrt{x} + 2$

d) $f(x) = \sqrt{x-4}$

$x = \sqrt{y-4}$

$x^2 + 4 = y$

$y = x^2 + 4$

e) $f(x) = \frac{7x+5}{4}$

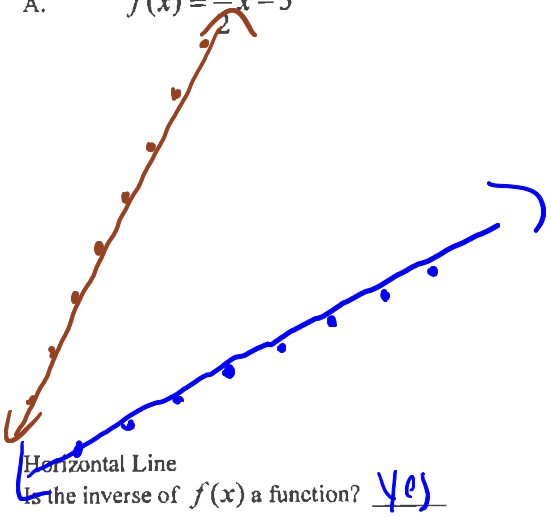
$x =$

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

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

3) the graphs of the Apply the Horizontal Line Test to determine if the function has an inverse function. Determine the inverse and graph it.

A. $f(x) = \frac{1}{2}x - 5$

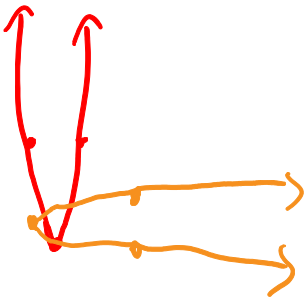


Horizontal Line

Is the inverse of $f(x)$ a function? Yes

$f^{-1}(x) = 2x + 10$

B. $f(x) = 4x^2 - 1$



Line Test:

Is the inverse of $f(x)$ a function? No

$f^{-1}(x) = \pm\sqrt{\frac{x+1}{4}}$

2 functions