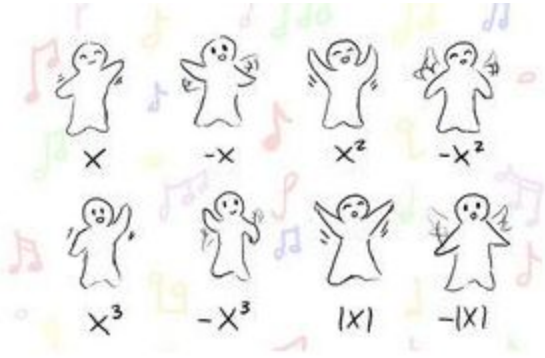
Name _____

Math 3 Unit 1: Functions and Inverses



		January 23 ● Solve absolute value functions ● Graph absolute value functions HW: 1.1	**January 24** ● Solve systems of equations HW: 1.2	**January 25** ● Solve systems of inequalities HW: 1.3
January 28 ● QUIZ!! ● Applications HW: 1.4	**January 29** ● Inverses of functions ● Function operations HW: 1.5	**January 30** ● Compositions of functions HW: 1.6	**January 31** ● Review for test HW: finish review	**February 1** ● TEST!!

1.1 - Solve and Graph Absolute Value Equations

Solve for x.

1. $|x-2|=4$

2. $4|x-2|+16=16$

3. $2|x+4|+10=6$

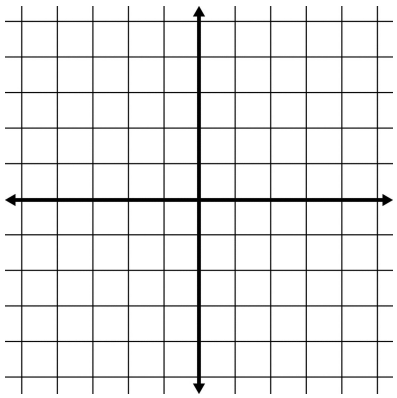
4. $|7x+9|-3=12$

5. $6|13x-3|=684$

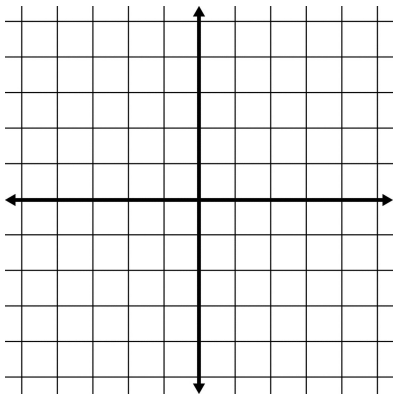
6. $\left|\frac{5}{3}x+2\right|+6=12$

Graph each absolute value function using a t-table.

7. $y=|x-4|-2$



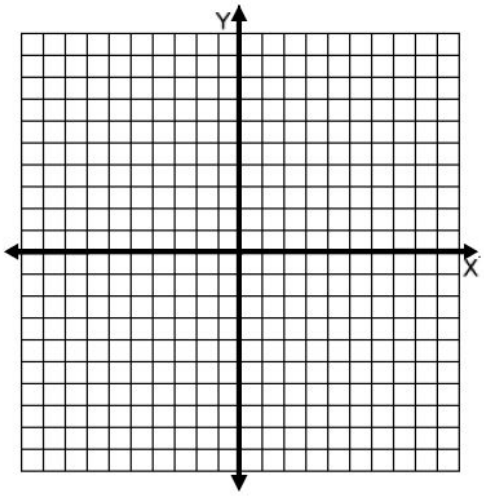
8. $y=-3|x+1|$



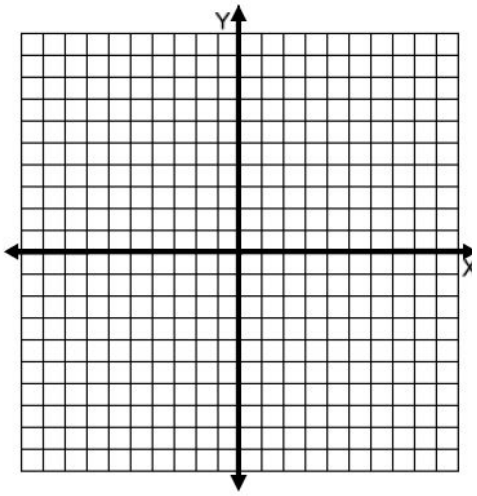
1.2 - Solve Systems of Equations

Solve each system of equations. Remember to express the answer as a point.

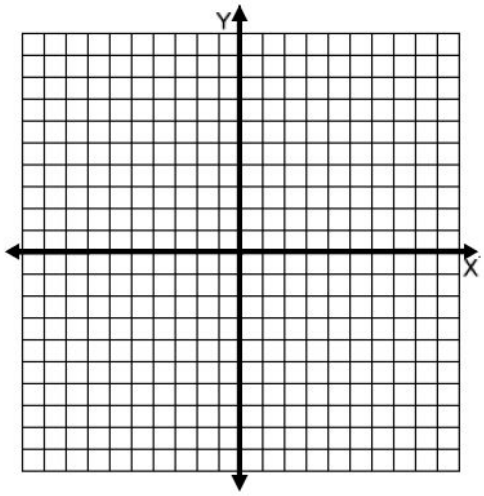
1. $y = 4x - 9$
   $y = x - 3$



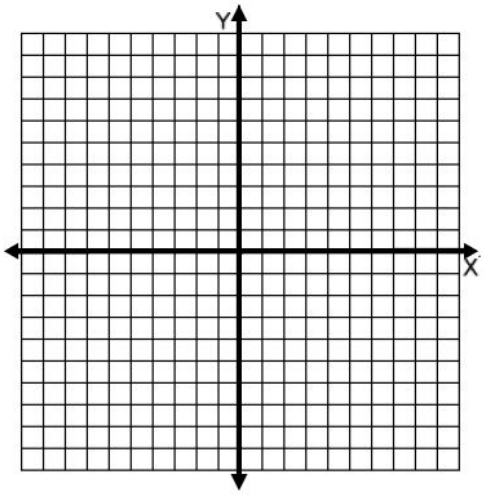
2. $x - 4y = 10$
   $-7x + 3y = 10$



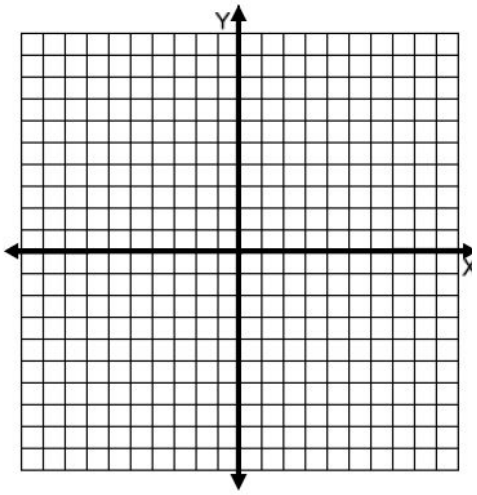
3. $y = (x + 3)^2$
   $y = 2x + 9$



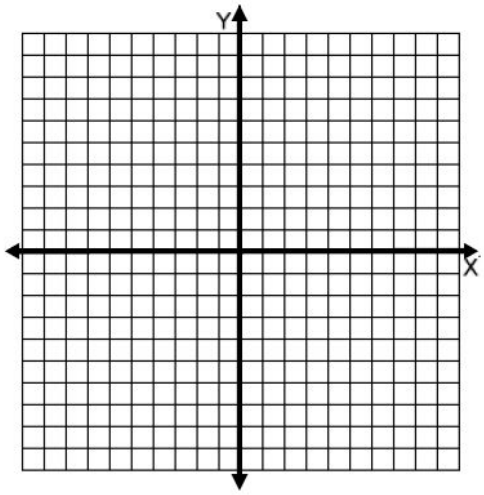
4. $y = x^2 + 4x + 4$
   $y = -|2x + 3| - 5$



5. $y = x^2 - 2x - 8$
   $x^2 + y = 16$



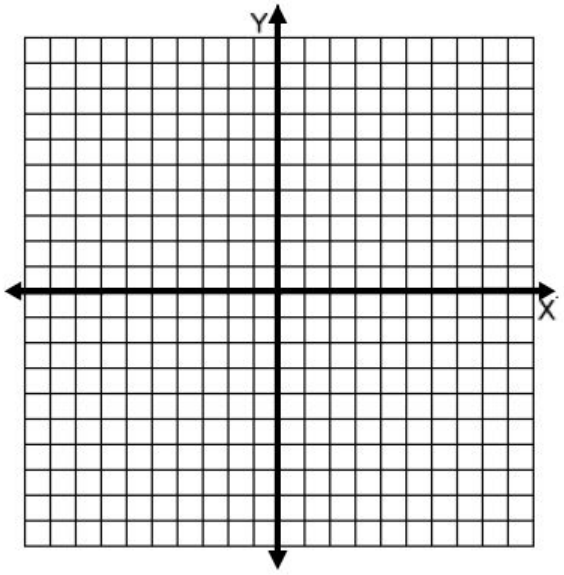
6. $y = 2|x - 4|$
   $x - y = -1$



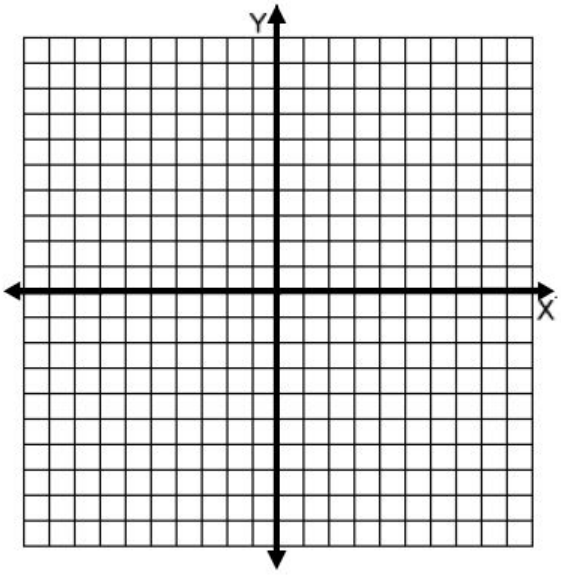
1.3 - Solve Systems of Inequalities

Solve each system of inequalities. Pay attention to whether the inequalities would have solid or dotted lines as well as where the shading belongs.

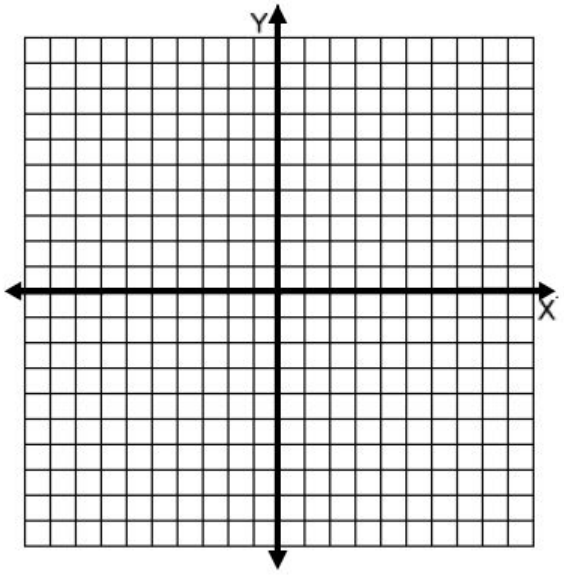
1. $y < -4x$
   $y \geq 3x - 2$



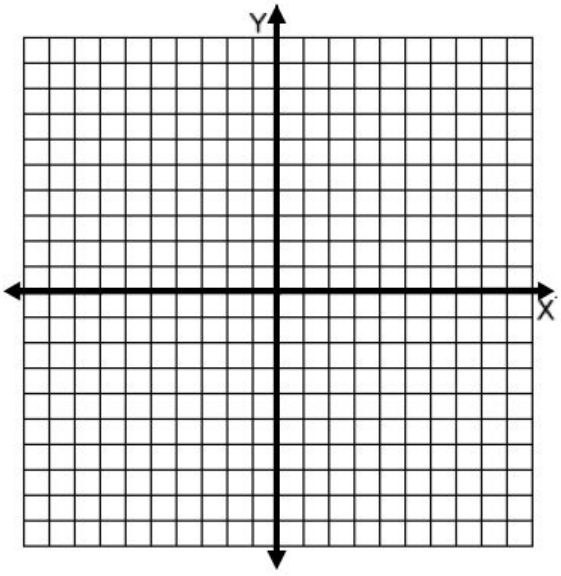
2. $y < -2x + 3$
   $y \leq x - 2$



3. $y > -x - 1$
   $y < x - 5$



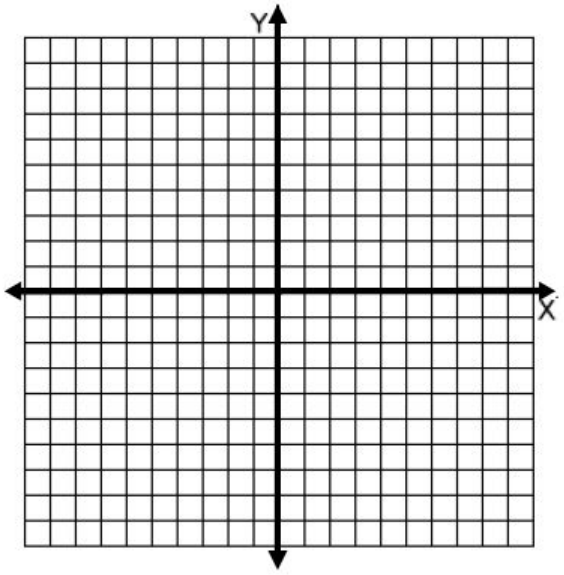
4. $x < -4$
   $3x + 2y \leq -2$



KEEP GOING!! -->

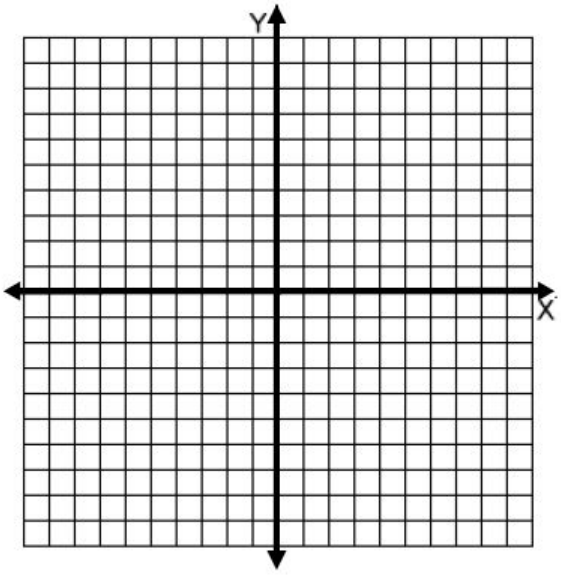
5. $x^2 + 3 > y$

$y < 2x + 1$



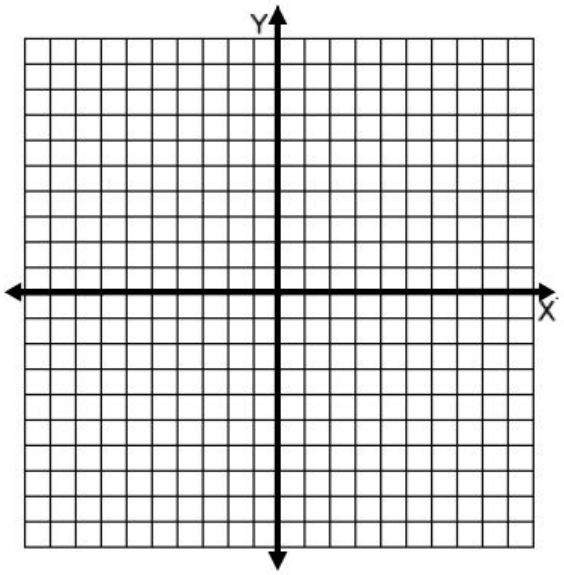
6. $y \geq x^2$

$y \leq -(x-1)^2 + 6$



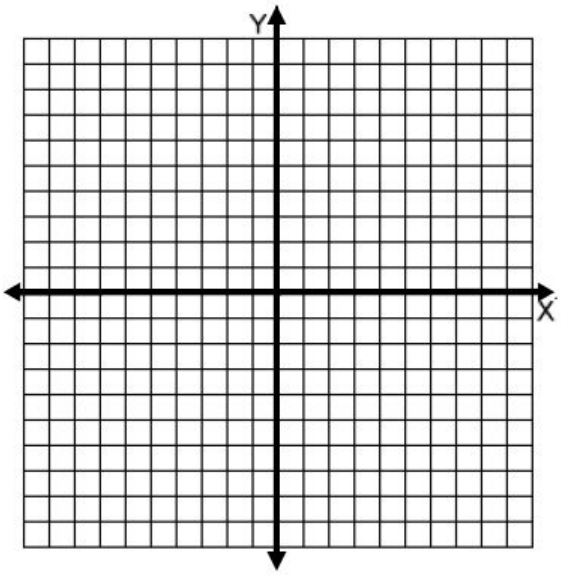
7. $y < |x + 3|$

$x - 4y > -20$



8. $x \leq 2$

$x > 4$



1.4 - Applications of Systems of Equations

1. The cost of 5 squash and 2 zucchini is $1.32, while 3 squash and 1 zucchini cost $0.75. Find the cost of each vegetable.

2. When Judy worked 8 hours and Ben worked 10 hours, their combined pay was $80. When Judy worked 9 hours and Ben worked 5 hours, their combined pay was $65. Find the hourly rate of pay for each person.

3. Rob has 40 coins, all dimes and quarters, worth $7.60. How many dimes and how many quarters does he have?

4. There are 13 animals in the barn. Some are chickens and some are pigs. There are 40 legs in all. How many of each animal are there?

5. Jones Cleaning Service charges a $30 fee to come to your house and $10 per room. Smiths Cleaning Service only charges a $10 fee to come to your house but $12.50 per room. How many rooms does a house need to have for both cleaning services to charge the same amount?

6. The length of a rectangle is 5 feet more than the width. The perimeter of the rectangle is 58 feet. Find the width of the rectangle.

1.5 - Inverses

Determine the inverse of each function.

1. $f = \{(1,-2),(-2,1),(0,7)\}$

2. $f = \{(-6,3),(8,2),(3,3)\}$

3. $f(x) = 3x - 4$

4. $f(x) = -6x + 4$

5. $f(x) = 5x + 2$

6. $f(x) = \frac{3x-1}{8}$

7. $f(x) = \frac{7x+9}{6}$

8. $f(x) = \frac{x-3}{5}$

9. $f(x) = \sqrt{x+5} + 2$

10. $f(x) = 17x^2$

11. $f(x) = (x+9)^2 - 5$

12. $f(x) = 5\sqrt{x-3}$

1.6 - Compositions of Functions

Given $f(x) = 3x + 3$, $g(x) = 6x - 5$, *and* $h(x) = x^2 + 14$, *find the following:*

1. $f(g(-3))$
2. $(f \circ h)(7)$
3. $g(h(24))$

4. $(h \circ f)(9)$
5. $g(f(0))$
6. $(h \circ g)(-4)$

7. $f(f(2))$
8. $(h \circ h)(5)$
9. $g(g(-6))$

Given $f(x) = 9 - x$, $g(x) = x^2 + 3$, *and* $h(x) = x - 2$, *find the following:*

10. $(g \circ f)(x)$
11. $f(g(x))$
12. $(h \circ f)(x)$

13. $f(h(x))$
14. $(h \circ g)(x)$
15. $g(h(x))$

16. $(g \circ g)(x)$
17. $h(h(x))$
18. $(f \circ f)(x)$