Graphing a System of Equations

Algebra 7.1

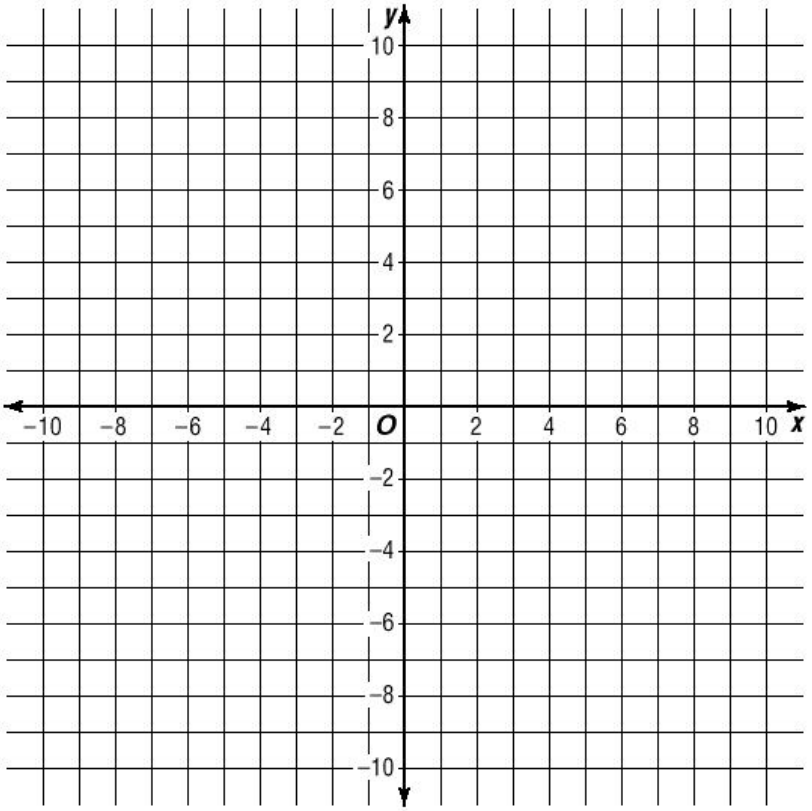
Given two equations, the solution is the point that satisfies both.

Graphing is the first way we will learn to solve a system of equations.

Example:
Find the solution to the following system of equations by graphing them.

$$y = \frac{2}{3}x - 5$$

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



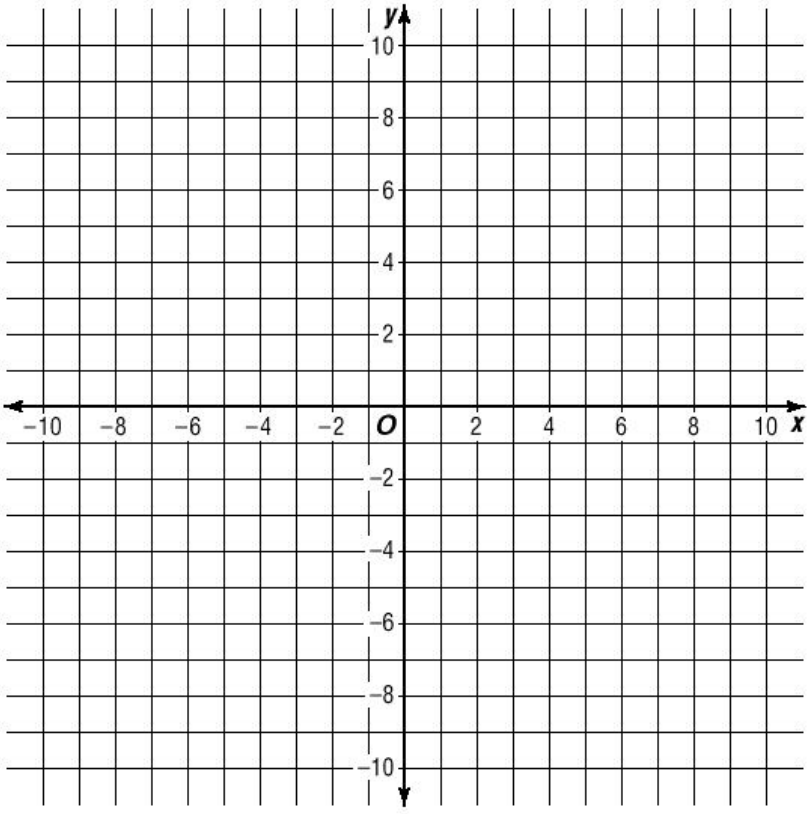
Practice:
Graph each and find the solution to each pair of equations:

1. a & b
2. b & c
3. a & c

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

b. $y = 2x - 1$

c. $x + y = -4$



Graphing a System of Equations

Algebra 7.1

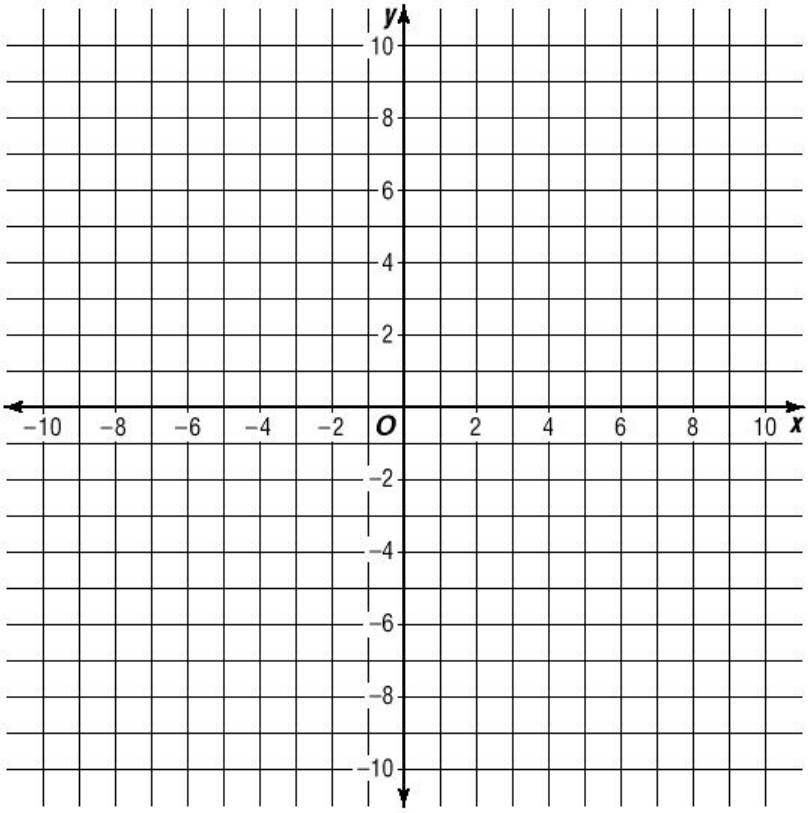
Practice:
Use a graph to determine the solution to each system of equations:

1. $y = 3x + 2$ &

$y = \frac{3}{4}x - 7$

2. $x + y = 4$ &

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



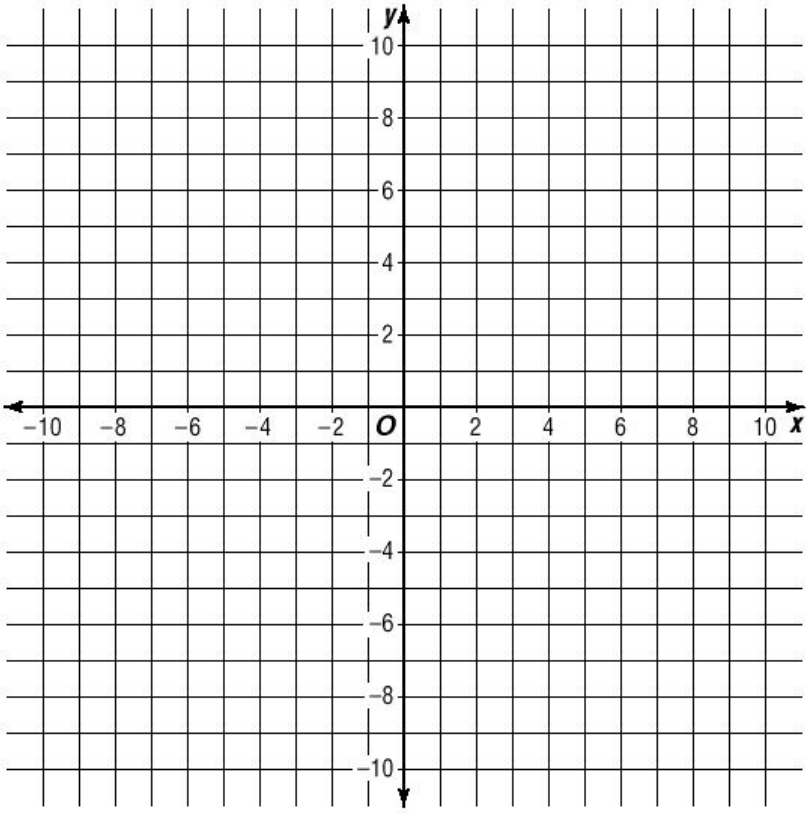
More Practice: Solve.

1. $y + 2 = \frac{2}{3}(x + 5)$ &

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

2. $2x + 5y = -20$ &

$x - y = 11$



Graphing Inequalities

Graphing Inequalities in Slope-Intercept Form

Works the same as graphing equations except:
Dash the line for < or >
Shade above if y >
Shade below if y <

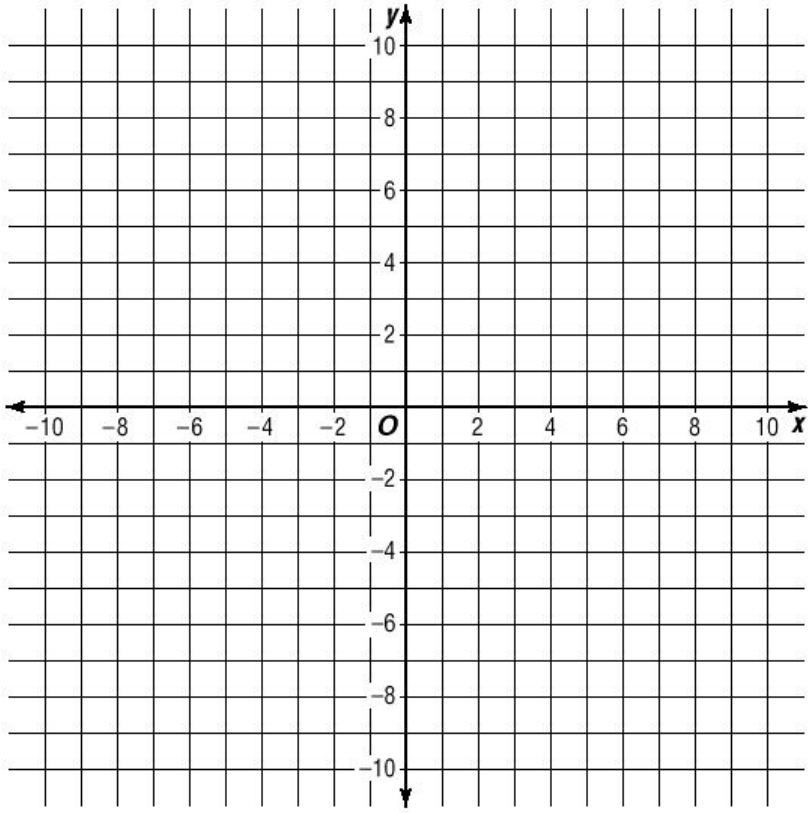
Examples:

1. $y \leq 2x - 5$

2. $y > -\frac{1}{3}x - 6$

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

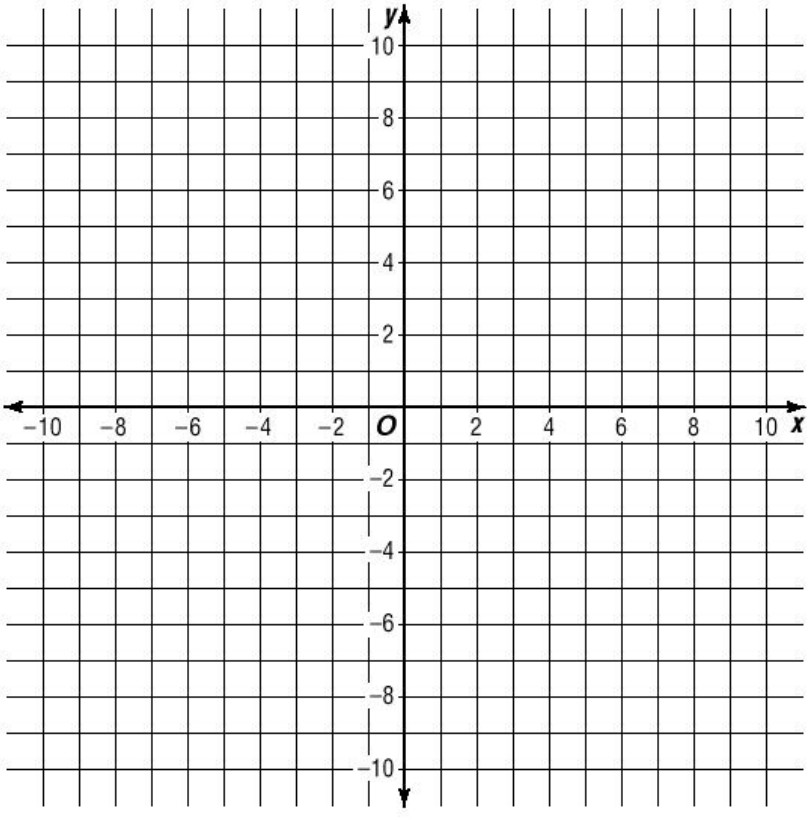
4. $y \geq 5x + 1$



Practice:

1. $y \leq -4x + 6$

2. $y > \frac{1}{5}x - 3$



Systems of Inequalities

Graphing a System of Inequalities

Graph and lightly shade each inequality.
Darken the area of overlap.
Test a point in the darkened area to check your graph.

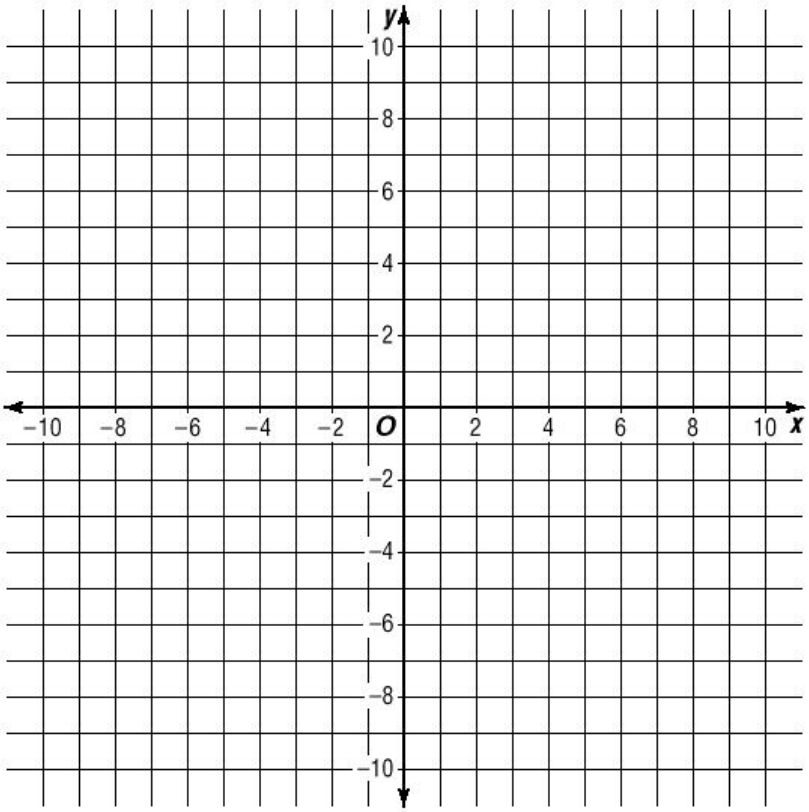
Examples:

1. $y < -2x + 6$

& $y \leq x - 5$

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

& $y \leq 2x - 10$



Practice:

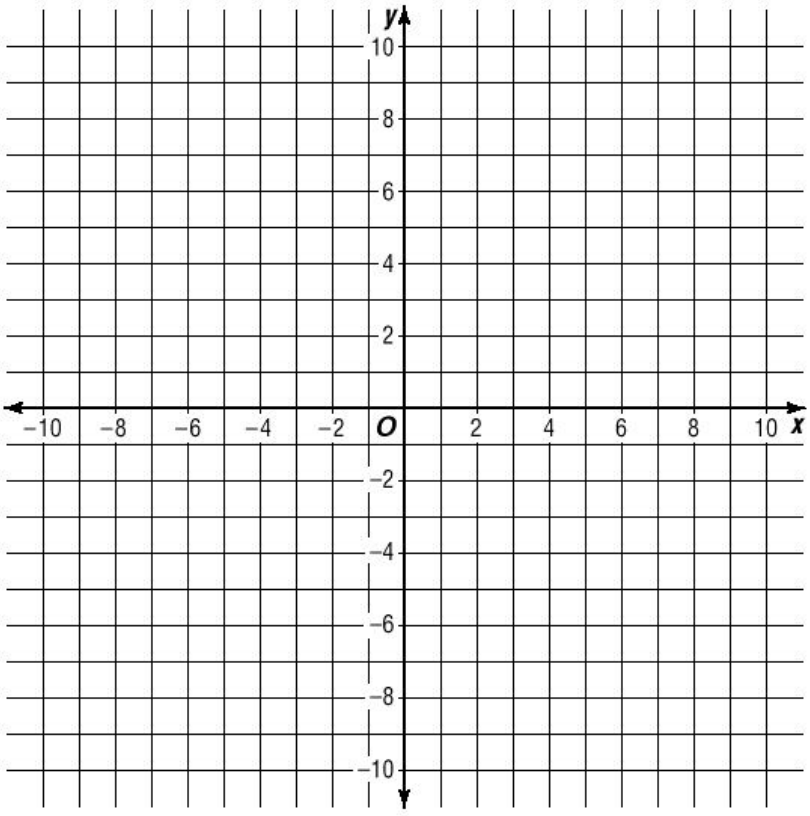
Graph each system of inequalities.

1. $y > \frac{2}{5}x + 3$

& $y > \frac{3}{2}x + 5$

2. $y \leq -\frac{3}{5}x + 4$

& $x - y \leq 2$



Systems of Equations

You can make comparisons by graphing equations.

Practice:

Compare three towing companies by writing an equation and graphing the charge of a tow based on the number of miles you need to be taken.

Auto Shop towing:

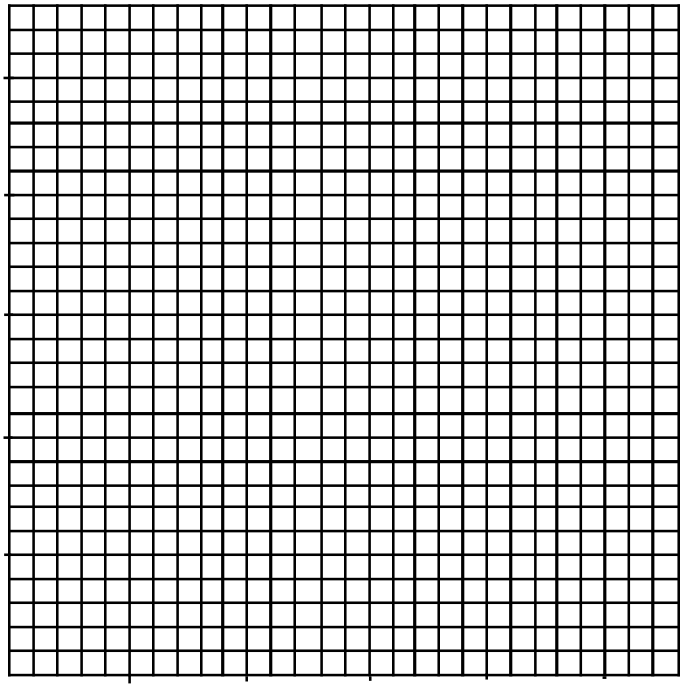
$15 to come pick you up, $.50 a mile for the tow.

Benny's wrecker service:

$10 to come pick you up, $.75 a mile for the tow.

Cary Automotive:

6 miles cost $10, 12 miles costs $19 (begin in point-slope, change to slope-intercept form)



Answer:

After how many miles are A and B the same price?
After how many miles are B and C the same price?
After how many miles are A and C the same price?

For what mileage is A the best deal?
For what mileage is B the best deal?
For what mileage is C the best deal?

Systems of Equations

Graph each pair of equations below to answer the questions that follow:

1. The Yellow Cab Company charges just $0.25 a mile, but it costs $5 to get in the cab. Express Cab charges no fee to get in the cab, but $1.50 a mile for the ride.

a. If you are going 7 miles, which cab company should you call?

b. If you are going 3 miles, which company should you call?

c. For what length of drive is the cost equal?

2. Ashley and Emma are reading the same article. Ashley is on page 1 of the article, but she can read a page every minute. Emma is already on page 5, but reads a page every three minutes.

a. What page is Ashley on after 5 minutes?

b. What equation could be used to represent the amount Emma has read?

c. How many minutes does it take before Ashley and Emma have read the same amount?

3. David and James are at the Famous Nathan's Hot Dog Eating Championships of the world in New York on the 4th of July. David was late starting, so James already had 6 hot dogs before David started eating. Form then on, James ate a hot dog every two minutes while David stuffed 1¼ hot dogs a minute.

a. What equations could you use to compare David and James' hot dog eating?

b. Between David and James, who would win the contest if it lasts 12 minutes?

c. How many minutes does it take David to catch up with James?

Name_____ Period _____

Santa's Elves

Algebra 7.6

Santa's elves are hard at work, and December is of course their busiest month. Four of Santa's elves are competing for the 'elf of the year' award, which is given to the elf who has the most completed toys by Christmas Eve.

Write an equation to represent each Elf below. Graph the equation for each elf on the back of this sheet and answer the questions that follow.

Alex 'slow and steady' McElf

Had 13 toys made to begin the month, and makes one new toy every four days.

Equation: _____

Bob 'the procrastinator' Elfington

After 3 days had only four toys made, but after nine days had ten toys made.

Equation: Point-Slope_____ Slope-Intercept _____

Cramden 'up all night' Elfman

Works 24 hours, all day and night, and manages to make one toy every 36 hours. He began the month in third place with 8 toys made. (Think about the slope!)

Equation: _____

Duke 'the maniac' S'elfish

Started the month with the most toys made (17), but the evil elf has been smuggling them out of the shop to sell on Ebay at a rate of one every three days. (He has a negative slope).

Equation: _____

1. On which days is Cramden in the lead, or tied for the lead?

_____

2. On what days is Alex in the lead or tied for the lead?

_____

3. When are Bob and Cramden tied?

_____

4. How many days does it take Bob to get out of last place?

_____

5. Think carefully: On what day does Duke lose the lead?

_____

6. Which elf should win the award (on the 24th)?

_____

Graphing Inequalities

Algebra 7.6

Graphing Inequalities in other forms:

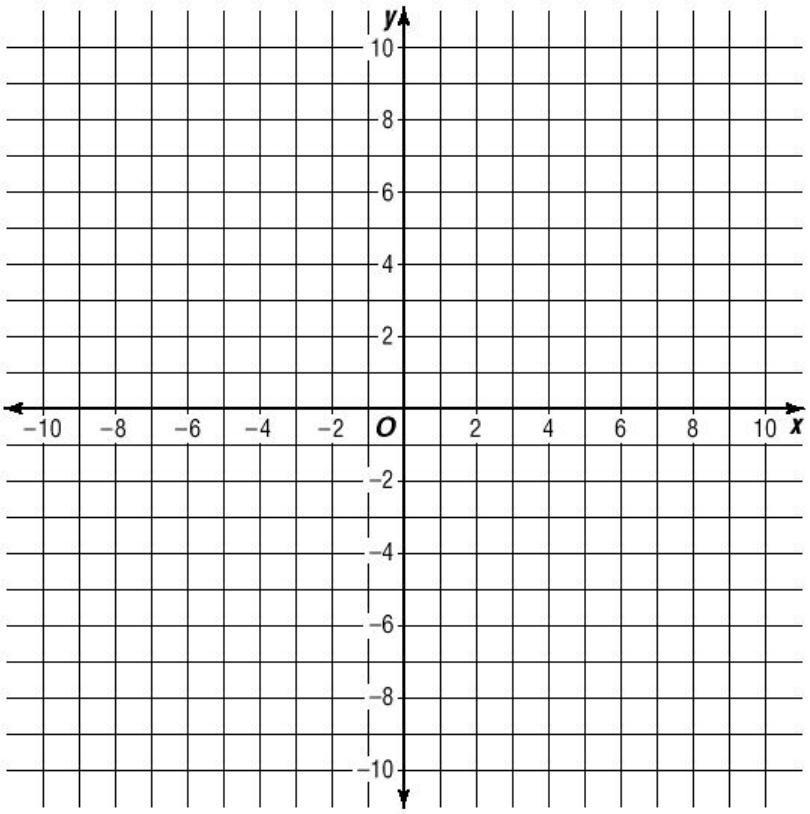
If an equation is hard to convert, or has a y-intercept that is not integral, Graph in Standard or Point-Slope Form and pick a point to test which side to shade.

Examples:

Point-Slope Form

1. $y+6>\frac{1}{3}(x-1)$

2. $y+7\leq-\frac{3}{2}(x+9)$

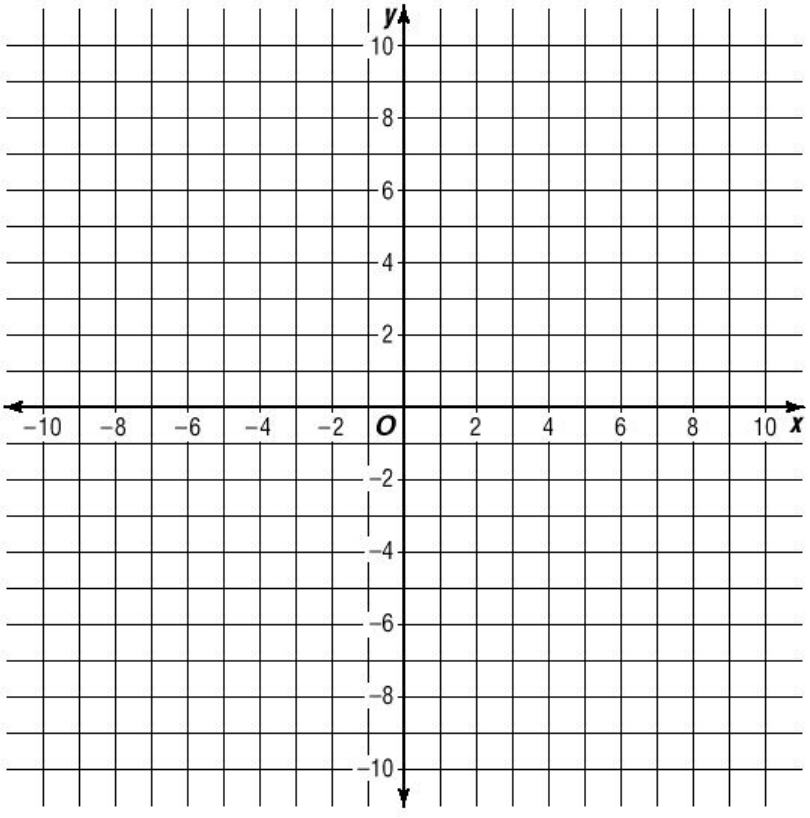


Practice:

Graph the following system of inequalities.

1. $y-6>\frac{1}{2}(x-9)$

& $y+2\geq-3(x-10)$



Name_____ Period _____

Review: Graphing Equations

Algebra 7.6

Solve each system of equations below by graphing:

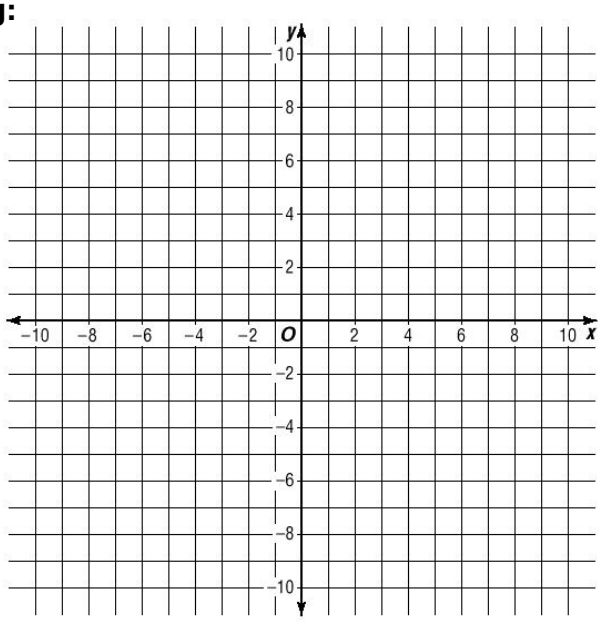
(two problems per graph)

1. $y=-\frac{2}{5}x+5$ solution: _____

& $y=-2x-3$

2. $y=\frac{1}{2}x-5$ solution: _____

& $x+3y=-30$

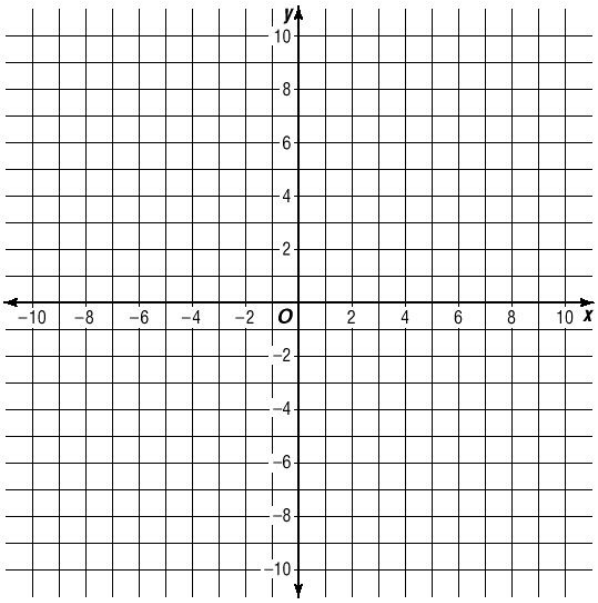


3. $3x+y=7$ solution: _____

& $x-y=-3$

4. $y=\frac{1}{9}x-2$ solution: _____

& $2x+3y=15$

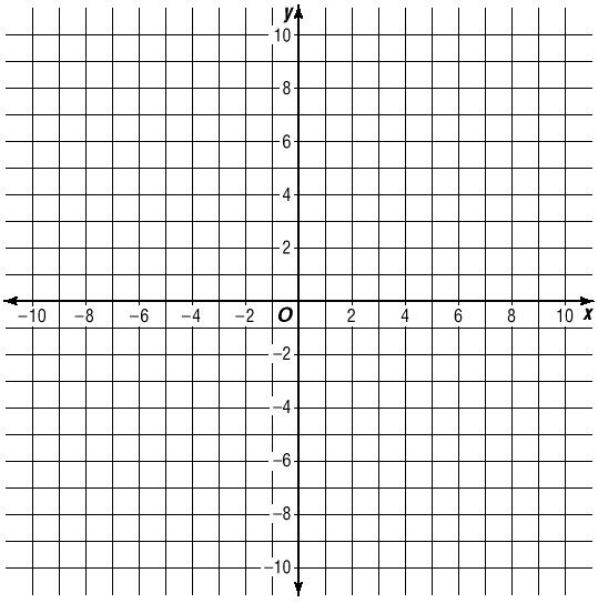


5. $2y=x$ solution: _____

& $y-6=-\frac{1}{3}(x+8)$

6. $y+3=\frac{3}{4}(x-5)$ solution: _____

& $y+7=-\frac{2}{5}(x+8)$



Name_____ Period _____

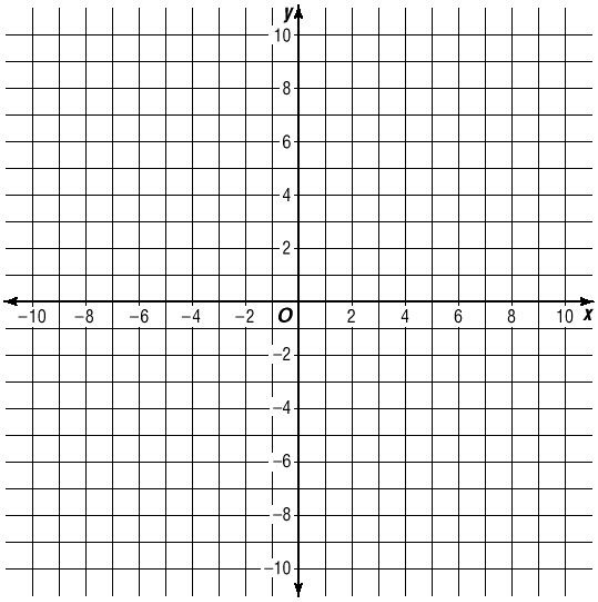
Review: Graphing Inequalities

Algebra 7.6

Graph each system of ineqalities NEATLY.

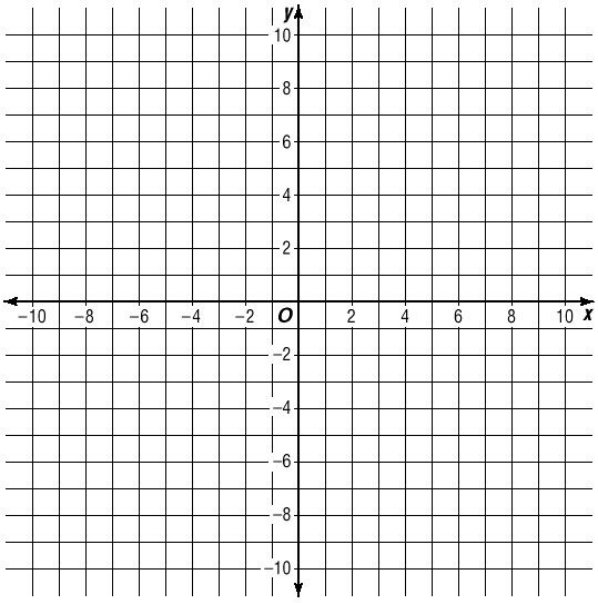
7. $y < \frac{2}{3}x + 8$

& $y \geq -2x + 3$



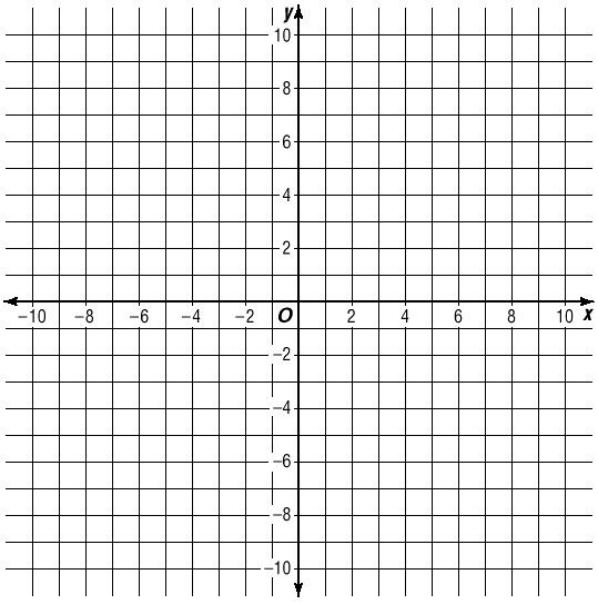
8. $y \geq \frac{1}{2}x + 2$

& $2x - 5y > -20$



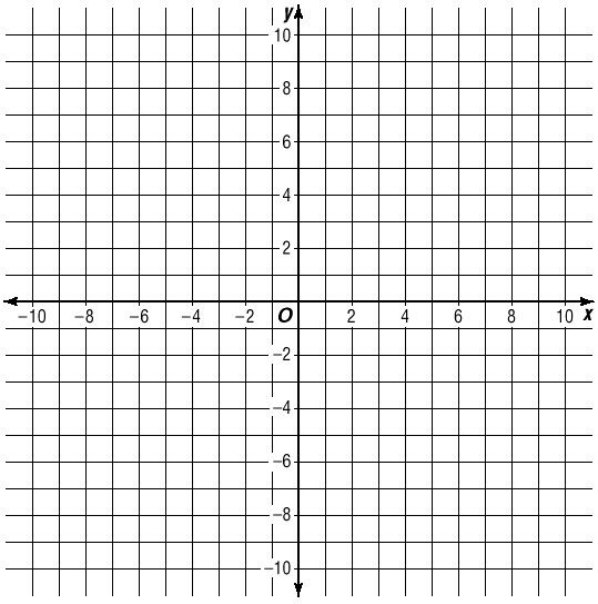
9. $y < -\frac{2}{5}x + 5$

& $y + 5 > \frac{1}{3}(x - 9)$



10. $y + 2 \geq 3(x + 8)$

& $y - 4 > \frac{1}{3}(x + 10)$



Name_____ Period _____

Practice Quiz: Graphing Systems

Algebra 7.6

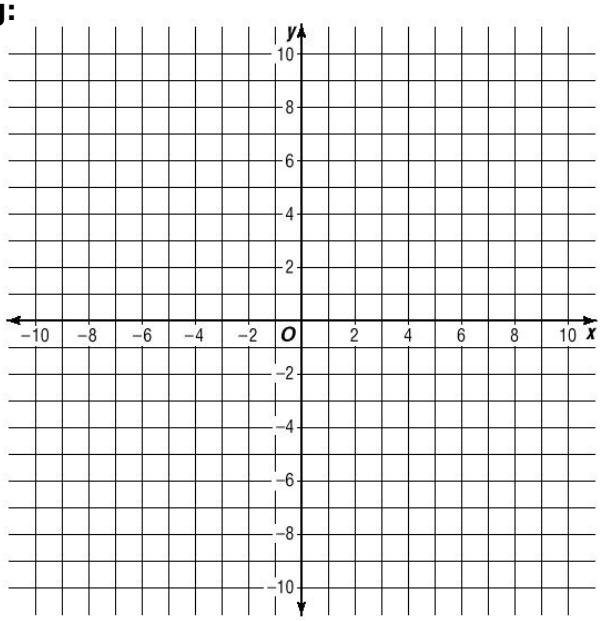
Solve each system of equations below by graphing:
(two problems per graph)

1. $y = \frac{1}{3}x + 4$ solution: _____

& $y = -2x - 10$

2. $y = \frac{1}{2}x - 6$ solution: _____

& $y = -\frac{2}{5}x + 3$

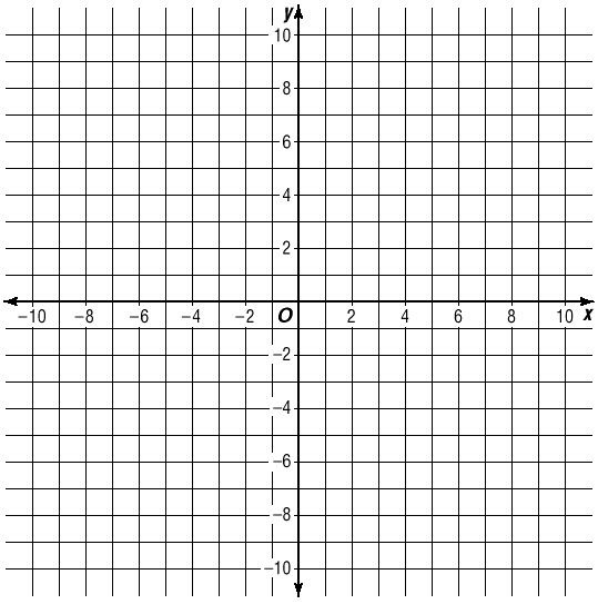


3. $y = 3x + 1$ solution: _____

& $y - 1 = \frac{2}{3}(x + 7)$

4. $4x - 3y = 18$ solution: _____

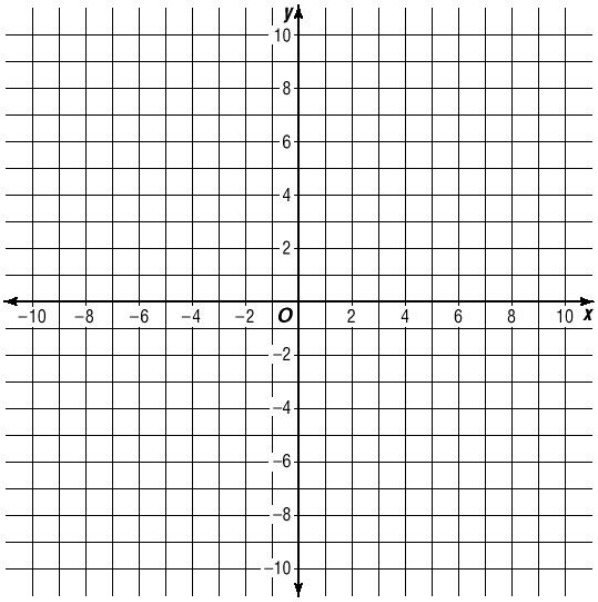
& $x - y = 5$



Inequalities: Graph and shade.

5. $y \leq -\frac{3}{2}x - 1$

& $x - 2y < -14$



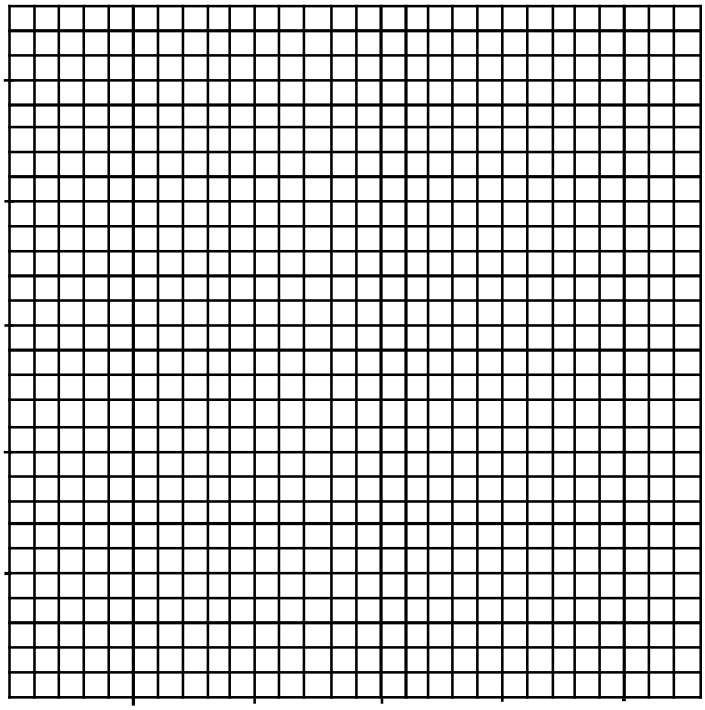
Name_____ Period _____

Practice Quiz: Graphing Systems

Algebra 7.6

Solve each with a graph:

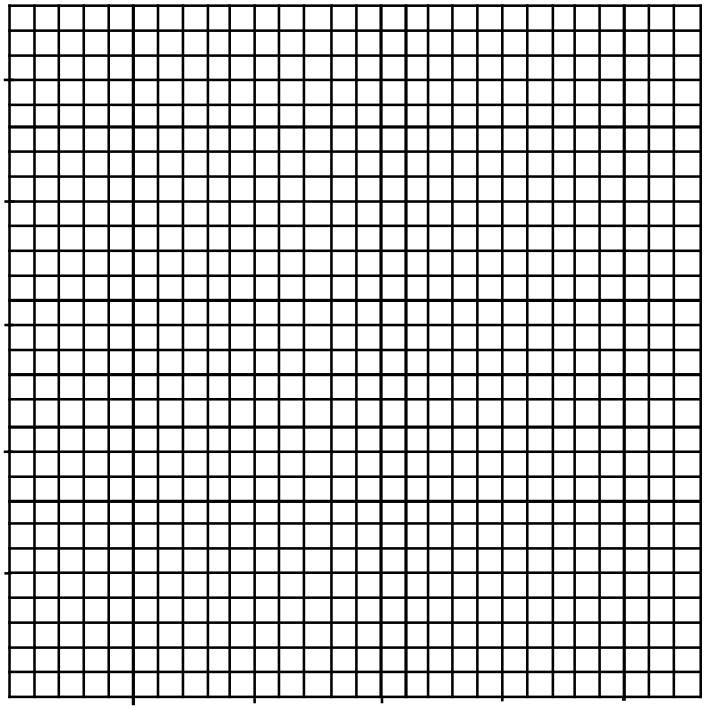
6-7. One phone company charges a $1 connection fee and $0.50 a minute for calls to Australia. A second company charges a connection fee of $5, but only charges $0.25 a minute.



6. How long is a phone call that costs the same with both companies? _____

7. How much does it cost? _____

8-9. Jared can make one Christmas ornament a minute, and he already has five made. Marissa can make three ornaments every two minutes, but does not have any made.



8. If they both start working at the same time, how many minutes will it take for Marissa and Jared to have the same number of ornaments made? _____

9. How many ornaments does each have made when they are tied? _____

Pledge:

Name_____ Period _____

Quiz: Graphing Systems

Algebra 7.6

Solve each system of equations below by graphing:

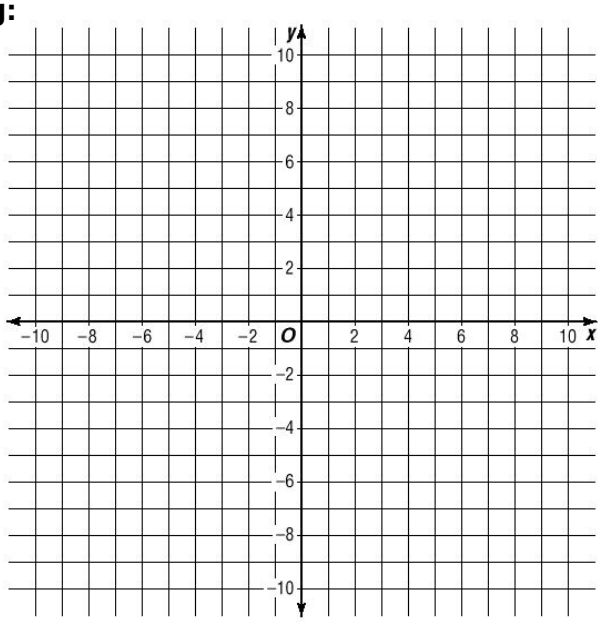
(two problems per graph)

1. $y = \frac{1}{3}x + 6$ solution: _____

& $x + y = 2$

2. $y = \frac{2}{5}x - 8$ solution: _____

& $x = \frac{1}{2}y$

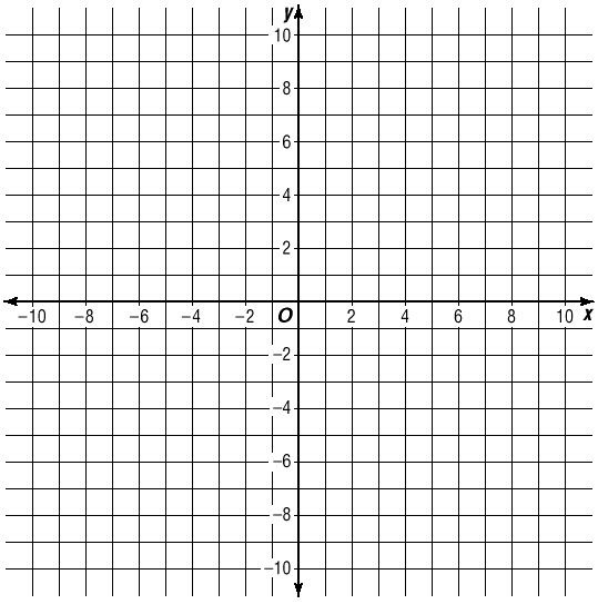


3. $y = -3x + 11$ solution: _____

& $y - 5 = -\frac{4}{3}(x + 3)$

4. $x + y = -9$ solution: _____

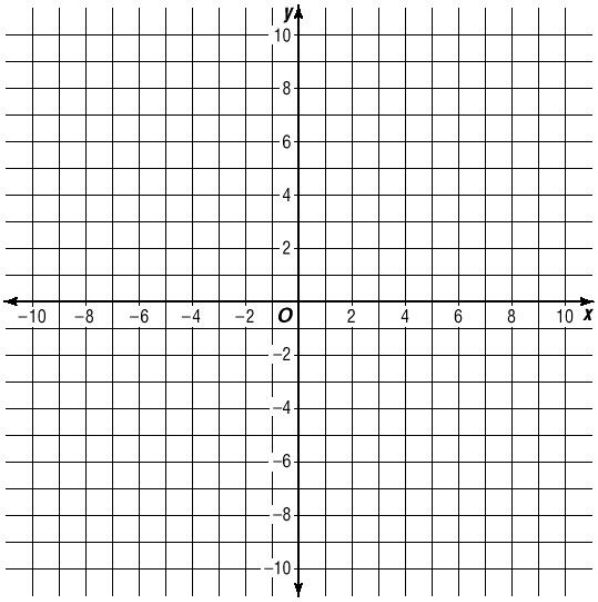
& $5y = 4x$



Inequalities: Graph and shade.

5. $y \geq \frac{1}{2}x + 6$

& $3x + 2y < 6$



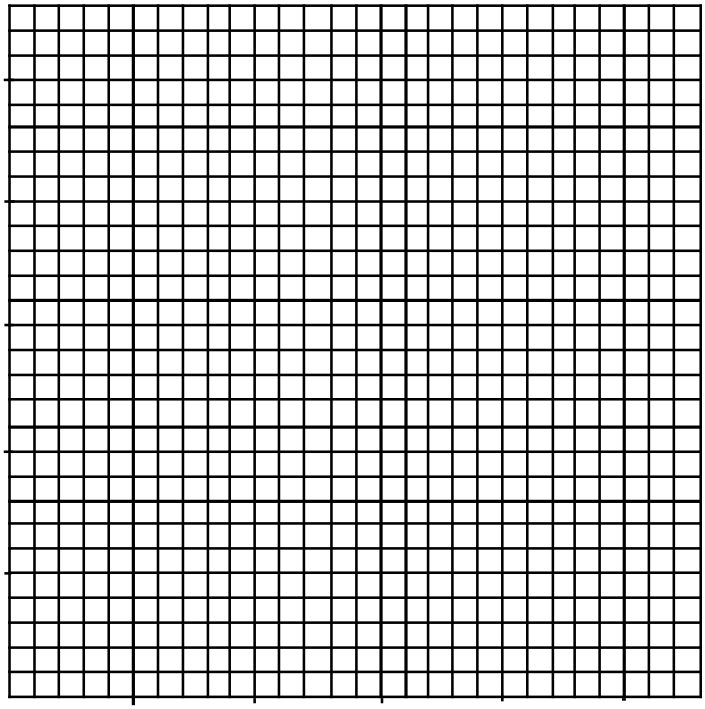
Name_____ Period _____

Quiz: Graphing Systems

Algebra 7.6

Solve each with a graph:

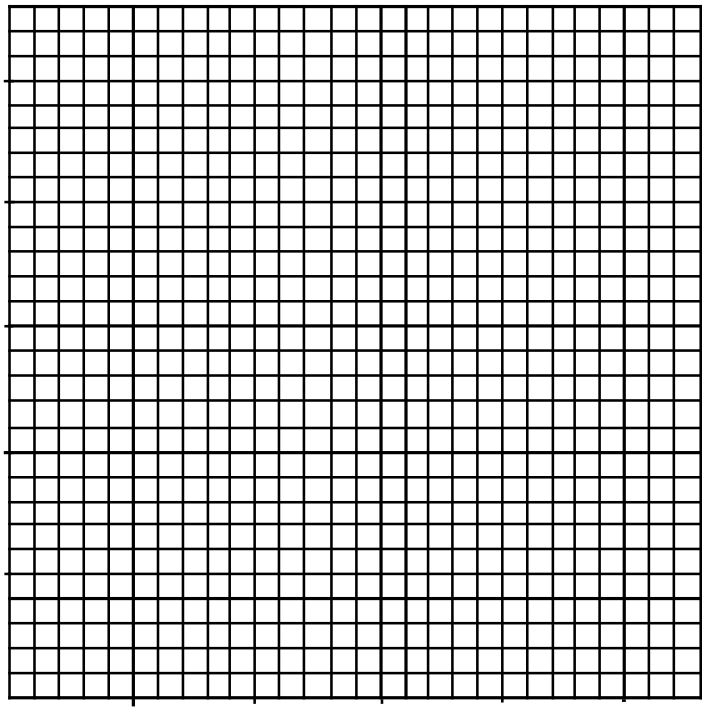
6-7. Candy is sold by the ounce at two stands at the mall. One stand charges $1.50 per ounce in a free bag. A second stand charges $6 for a jar that you can fill for $0.75 per ounce.



6. How many ounces must be bought for the cost of the bag of candy to equal the cost of the jar? _____

7. What is the cost when they are equal? _____

8-9. Ken and Kayla are reading a book. Ken is already on page 8 and reads a page every two minutes. Kayla has just started reading and can finish a page in just 40 seconds.



8. How many minutes does it take for Kayla to reach the same page as Ken? _____

9. What page are they on when Kayla and Ken begin the same page? _____

Pledge:

Substitution

Review:
Solve each of the following equations for y using the given value for x.

1. $y = 3x + 2$ for $x = -7$

2. $y = -\frac{2}{5}x - 3$ for $x = 10$

3. $y = -2x + 9$ for $x = y + 3$

Substitution:
Mehtod 1: Graphing
Method 2: Substitution

To solve a system of equations using substitution:
Solve one equation for x (or y).
Substitute this value into the other equation and solve for y (or x).

Ex. $y = 3x + 9$ and $y - x = -7$

Harder Example $7y = 2x + 63$ and $2x - y = 15$

Practice:
Solve each system using substition.

1. $y = -3x + 5$
$x + y = 9$

2. $x - 2y = 5$
$y = x - 6$

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

4. $5x - 3y = -1$
$2x - y = 1$

Substitution

Review:
Solve each system below using substitution.

1. $y = \frac{1}{2}x - 3$ for $x = 2y + 6$

2. $y = \frac{2}{3}x + 7$ for $2x - 3y = 12$

When solving a system using substitution, you sometimes arrive at a 'dead end'.

Examples of 'No Solution': 3=2 or 5=0
If you get to x=3x, this does NOT mean there is no solution. What value works in this case for x?

Examples of 'Infinite Solutions' (Identities): 3=3 or 2x=2x or x-3=x-3

Practice:
Solve each system using substition. Write No Solution or Infinite Solutions where applicable.

1. $y = x + 5$
$x - y = 9$

2. $x - 3y = 8$
$3y - x = -8$

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

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

Elimination

Review:
Solve each of the following equations using Substitution:

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

2. $3x - 5y = 26$
$4x + 5y = -12$

Elimination:
Method 1: Graphing
Method 2: Substitution
Method 3: Elimination

To solve a system of equations using elimination:
Add the two equations to eliminate a variable (x or y).
Adjust the equations with multiplication before adding them if necessary.

Ex. $4x + 5y = -12$ and
$3x - 5y = 26$

Harder Example: $2x - 3y = -10$ and
$5x = 6y - 31$

Practice:
Solve each system using elimination.

1. $2x - y = -9$
$3x + y = -16$

2. $4x - 3y = -17$
$2x + 5y = 11$

Practice:
Solve each system using elimination.

1. $x = -3y + 3$
$-3x = 2y - 30$

2. $3x - 5y = -23$
$5x - 3y = -1$

Substitution and Elimination

Algebra 7.3

Review:

Solve each of the following using substitution or elimination:

1. $y = 3x - 2$
$3x - 2y = -8$

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

Use Substitution when at least one variable has a coefficient of 1 (or -1).
Use Elimination when variables share the same coefficient.
Both will always work, if neither of the above is true, use whichever method you are more comfortable with.

Examples:
Substitution or Elimination? (DO NOT SOLVE)

1. $y = 3x - 5$
$x = y - 3$

2. $5x - 2y = 11$
$2x + 2y = 3$

3. $3x - y = 31$
$3y = x - 5$

Now, solve them.

1. $y = 3x - 5$
$x = y - 3$

2. $5x - 2y = 11$
$2x + 2y = 3$

3. $3x - y = 31$
$3y = x - 5$

Use Substitution or Elimination to solve the following.

1. $y = 2x - 8$
$2x + 3y = 0$

2. $5x - 3y = -8$
$x + 24 = 2y$

3. $5x = 2y - 1$
$x + y = 11$

Name_____ Period _____

Substitution and Elimination

Algebra 7.6

Substitution and Elimination:
Solve each using substitution or elimination.

1. $y = 3x - 11$
$x = 2y - 3$

2. $x + y = -5$
$x = y + 3$

3. $2x - y = 11$
$x = y + 3$

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

5. $y = -3x + 5$
$y = x - 7$

6. $x + 3y = 2$
$2x - y = -10$

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

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

9. $2x - 3y = -11$
$x + y = 2$

10. $2y = x - 5$
$2x - 4y = 10$

11. $2x - 3y = -5$
$2x + y = 11$

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

Name_____ Period _____

Substitution and Elimination

Algebra 7.6

Substitution and Elimination:
Solve each using substitution or elimination.

13. $3x + 4y = 2$
$4x = 4y + 12$

14. $y = 3x + 3$
$3x + 2y = -12$

15. $2x - 3y = -24$
$x + 6y = 18$

16. $y = -4x$
$x + 2y = -7$

17. $x = 3y - 4$
$2x + 6y = 5$

18. $3x - 2y = 11$
$x - \frac{1}{2}y = 4$

19. $0.3x - 0.2y = 0.5$
$x + 2y = 15$

20. $x - 7 = 2y$
$4x - y = 9$

Name_____ Period _____

Practice Quiz: Systems of Equations

Algebra 7.6

Solve each system of equations below by graphing:

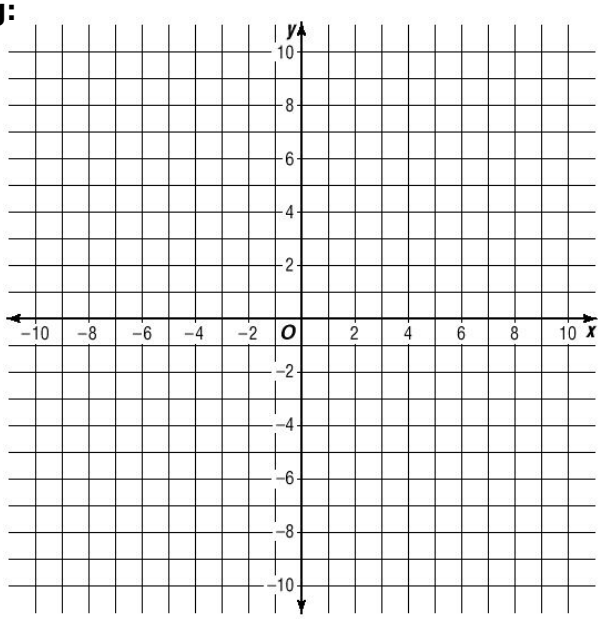
(two problems per graph)

1. $y = \frac{1}{3}x + 5$ solution: _____

& $y = -2x - 9$

2. $y = \frac{1}{2}x - 6$ solution: _____

& $y = \frac{2}{3}x - 7$

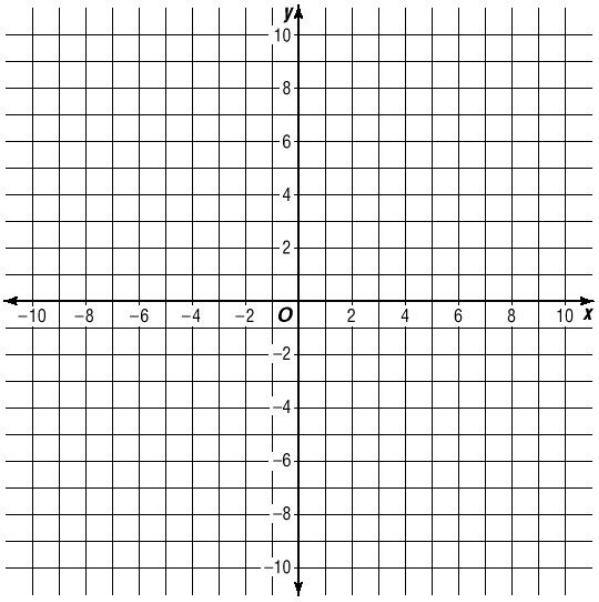


3. $y = x - 3$ solution: _____

& $y = \frac{2}{5}x$

4. $y + 9 = \frac{1}{4}(x + 1)$ solution: _____

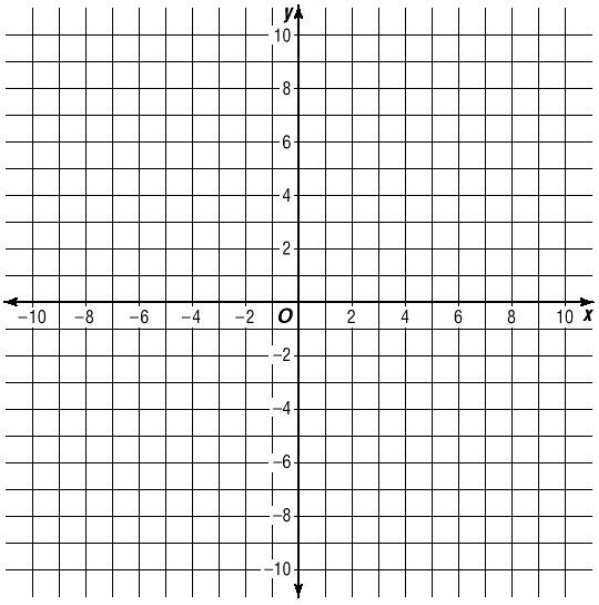
& $2x + y = -2$



Inequalities: Graph and shade.

5. $y \geq \frac{1}{3}x + 6$

& $y < 3x + 1$



Name_____ Period _____

Practice Quiz: Systems of Equations

Algebra 7.6

Solve each system of equations below by using substitution or elimination.

6. $x + 2y = -2$
& $3x - 2y = 18$

solution: **6.** _____

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

solution: **7.** _____

8. $y = \frac{2}{3}x - 4$
& $2x - 3y = -15$

solution: **8.** _____

9. $y = x + 1$
& $x = y - 1$

solution: **9.** _____

10. $4x + 3y = -4$
& $2x - 5y = 11$

solution: **10.** _____

11. $y = x - 6$
& $4x - y = 24$

solution: **11.** _____

Word Problems: Systems

Algebra 7.3

Word problems:
1. Find and label the two variables.
2. Write and solve a system of equations.

Example:
Tammy works two jobs. As a clerk she earns $7 an hour. As a receptionist she makes $9 an hour. One week she worked 24 hours and earned $200. How many hours did she work at each job that week?

What are the two VARIABLES?

What equations could compare these two variables?

hint: Money Equation: _____

Hours Equation: _____

Solve using elimination OR substitution.

Practice:
Write a system of equations and solve:

1. Alyssa scored 54 points in her basketball game. If she made 24 shots, how many of her shots were 2-pointers, and how many were 3-pointers?

2. Brian sold fruit at his stand. Apples cost $.40 and pears cost $.50 each. In an afternoon he sold 52 pieces of fruit and made $24. How many of each did he sell.

3. Melinda needed to mail a package. She used $.02 stamps and $.10 stamps to mail the package. If she used 15 stamps worth $.78, how many of each type of stamp did she use?

20 apples, 32 pears. **9 $.02, 6 $.10**

Name_____ Period _____

Word Problems: Systems

Algebra 7.6

Solve each using a system of equations.

1. A test contains 35 questions worth a total of 100 points. There are seven-point questions and two-point questions. How many two-point questions are there? How many seven-point questions?

Equations: x + y = 35 2-pts: _____

_____ 7-pts: _____

show work below!

2. The math club and the science club bought supplies for a retirement home. The math club bought six cases of juice and one case of bottled water for $135. The science club bought four cases of juice and two cases of bottled water for $110. How much does a case of juice cost? How much for a case of water?

Equations: 6j + 1b = 135 Juice: _____

_____ Water: _____

show work below!

3. In a parking lot there are motorcycles and cars. You count 98 wheels, and your friend counts 30 vehicles. How many cars are there? How many motorcycles?

Equations: m + c = 30 Cars: _____

_____ Motorcycles: _____

show work below!

Name_____ Period _____

Word Problems: Systems

Algebra 7.6

Solve each using a system of equations.

4. John sells hamburgers ($3) and cheeseburgers ($3.50). One afternoon he sells a total of 24 burgers for $79. How many of these were hamburgers, and how many were cheeseburgers?

Equations: h + c = 24 Hamburgers: _____

_____ Cheeseburgers: _____

show work below!

5. James paddles upstream in a canoe at 2mph (relative to the shore), and when he paddles down-stream, he goes 9mph. Find the speed of the current (c) and the speed James can paddle in still water (p).

Equations: p + c = 9 Paddle speed: _____

_____ Current speed: _____

show work below!

6. Lisa buys sports supplies for the gym. On Monday, she buys four basketballs and three soccer balls for $85.50. On Tuesday she returns to the store and buys three basketballs and five soccer balls for $115. How much do soccer balls cost? How much for basketballs?

Equations: _____ Soccer balls: _____

_____ Basketballs: _____

show work below!

Word Problems: Systems

Algebra

Word Problems Practice: Money problems.
Write a system of equations and solve:

1. Anna has a pocket of dimes and quarters. If she has 10 coins worth $1.45, how many of her coins are quarters?

2. Popsicles cost $0.80, and ice-cream cups cost $0.65. If you purchased 9 items for $6.15, how many of the items were popsicles.

Word Problems Practice: Sum / Difference
Write a system of equations and solve:

1. The sum of two integers is 19 and their difference is 10. What is the smaller of the two integers?

2. If I add Mark's age to Tammy's age, I get 39. If I subtract Mark's age from Tammy's age, I get negative 7. What will I get if I multiply Mark's age by Tammy's?

Word Problems Practice
Write a system of equations and solve:

1. Mr. Batterson ordered pizzas for the team. Medium pizzas have 8 slices and large pizzas have 10. If there are 13 pizzas and 108 slices, how many large pizza slices are there?

2. At a toy store, the children's department has bicycles and tricycles. There are 50 total, and 111 wheels. How many bicycles are there?

Word Problems Practice: Time
Write a system of equations and solve:

1. In five years, Kate will be twice as old as Joey. Right now, Kate is 11 years older than Joey. How old is Joey right now?

2. A bucket is full of red marbles and white marbles. There are twice as many white marbles as red ones. If I add seven white marbles, there will be three times as many white marbles as red ones. How many marbles were in the bucket before the white marbles were added?

Name_____ Period _____

Word Problems: Systems

Algebra

Solve each using a system of equations.

1. A farm has chickens and cows. You ask the farmer how many chickens he has, and how many cows he has. The farmer tells you he has 28 healthy animals, and they have a total of 64 legs. How many of his animals are cows?

1. _____

2. Andrew has a collection of soda bottles. Some of them are 12-ounce bottles, and others are 16-ounce bottles. If the collection contains 20 bottles which hold a combined 300 ounces, how many of the soda bottles are 12-ounce bottles?

2. _____

3. Jack and Cameron are playing a game of paper football. By their rules, you can score a 5-point touchdown or a 7-point touchdown. In the game, there have been 13 touchdowns scored for a total of 71 points. How many of these touchdowns were 7-point touchdowns?

3. _____

4. Abbi has $400 in $5 bills and $20 bills. If she has 38 bills, how many of them are $20 bills?

4. _____

5. The sum of two numbers is 40 and their difference is 6.5, what is their product?

5. _____

6. This year, Jake is 5 years older than his sister. Three years ago, Jake was twice his sister's age. How old is Jake's sister now?

6. _____

Word Problems: Systems

Algebra 7.3

Using Percents

Review: If you have 15 quarts of drink that is 20% Sprite, how many quarts of Sprite are in the drink?

Example:

John is making punch. How many cups of 50% juice should he add to a drink that contains 10% juice if he wants to make 15 cups of punch containing 20% juice? (how many cups of each drink)

x=50% juice y=10% juice

$x + y = 20$ **Total Drink (cups).**

$0.5x + 0.1y = 0.2(15)$ **Juice (cups).**

Solve using substitution or elimination.

Practice:

Write a system of equations and solve:

1. You combine a 10% saltwater mixture with a 40% saltwater mixture to create 6 gallons of a 30% saltwater solution. How many gallons of each mixture did you use?

2. Margaret is making fruit punch. She has juice drink that contains 25% orange juice. How much pure orange juice will she need to combine with the drink to make 17 quarts of a drink that is 60% orange juice?

3. How much of a 90% solution of acid should be added to a 60% acid solution to create a 5-liter solution that contains 70% acid?

4. Planters is making a new mixture combining Peanuts and Cashews. Cashews cost $7 a pound and Peanuts are $4 a pound. How many pounds of each should be added to make a ten pound mixture that sells for $4.20 a pound?

Extra: The sum of the digits in a two-digit number is 11. If the digits are reversed, the number is 27 less than the original. Find the number.

Name_____ Period _____

Word Problems: Systems

Algebra 7.6

Solve each using a system of equations.

1. How much of a 15% vinegar solution should be added to a 35% vinegar solution to make 12 liters of a 20% vinegar solution?

Equations: $0.15x + 0.35y = .20(12)$

$x + y = 12$

(x) 15% _____

(y) 35% _____

show work below!

2. How many gallons of paint with 40% blue pigment should be added to paint that contains pure (100%) blue pigment to create 20 gallons of a paint that contains 85% blue pigment?

Equations: _____

_____

(x) 40% _____

(y) Pure _____

show work below!

3. You are taxed at a rate of 5% for all online purchases and 8.5% for all in-store purchases. If you pay a total of 40$ in taxes in addition to spending $500 on purchases (pre-tax), how much money did you spend online, and how much was spent in the store? (before tax, to the cent)

Equations: $0.05x + 0.085y = 40$

_____

(x) online: _____

(y) in-store: _____

show work below!

Name_____ Period _____

Word Problems: Systems

Algebra 7.6

Solve each using a system of equations.

4. You have a dish full of nickels and quarters. If there are 16 coins together worth $2.20, how many of each coin do you have?

Equations: $n + q = 16$ nickels: _____

_____ quarters: _____

show work below!

5. Two men ask you to guess their ages based on the following clues:
The sum of their ages is 76. One of the men is 16 years older than twice the age of the other.

Equations: $x + y = 76$ (x) 1st man: _____

_____ (y) 2nd man: _____

show work below!

6. When the digits of a two-digit number are switched, the resulting number is 18 less than the original. If the sum of the digits in the number is 12, find both numbers (show work as a system of equations, do not use guess-and-check)

hint: Using x as the tens digit, y as the ones digit. 10x+y is the original number, 10y+x is the number after the digits are switched.

Equations: $x + y = 12$ Bigger #: _____

_____ Smaller #: _____

show work below!

Name_____ Period _____

Graphing Using the TI-83

Algebra 7+

Start:

1. Turn on your calculator and clear the memory.
Hit [2nd] then hit the [+] symbol and follow the menus to RESET all RAM.
(This varies by calculator)

2. Darken or lighten the screen as necessary by hitting [2nd] and using the up arrow/down arrow.

Now lets graph some lines.

Find the **graph** button just below the screen. Push it.

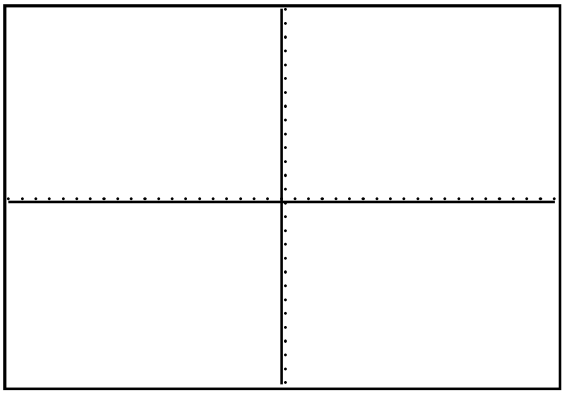
Touch the arow keys. A cursor should appear. You can move it around the screen.

To graph an equation, you need to enter it into your calculator.

[y=] : Hit the y= button at the top left.
This is where you will enter equations to be graphed.
Enter the three equations written on the board and hit GRAPH again (I will help explain entering the equations. Write all three below).

Y_1=_____ Y_2=_____ Y_3=_____

Can you tell which graph is which? *Sketch* and label the three equations onto the graph below.



If you mess up the graph, hit **ZOOM** then **6: Standard** to get back to the regular graph setup. We will learn more about ZOOMing later.

[TRACE] : Hit the trace button.
Use the left and right arrows to trace along one of the lines.
Use the up and down arrows to switch between lines. The equations should show at the top of the screen as you switch between lines.
Trace until you reach an intersection between lines Y1 and Y2. Can you find the exact point of intersection?

CALC : Above the trace button, you will find the word CALC. Hit 2nd then TRACE to get to the CALC [TRACE] menu.

Choose **5: Intersect**
Following the prompts at the bottom of the screen, select lines Y1 (ENTER) and Y2 (ENTER), then move the cursor close to the intersection point when it asks for a guess and hit ENTER again. (you do not really need to get that close). Where do lines Y1 and Y2 intersect?

Name_____ Period _____

Graphing Using the TI-83

Algebra 7+

Practice:

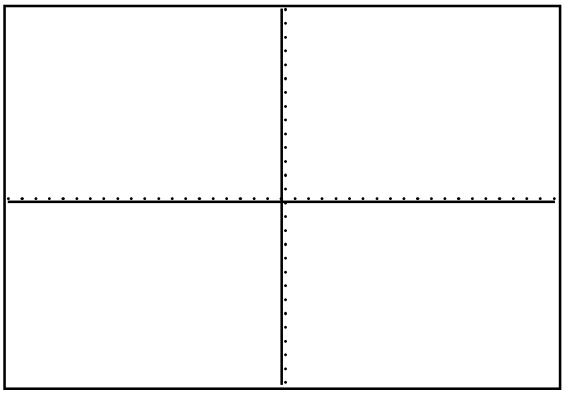
Graph the following equations and sketch an *approximation* of the graph from your screen.

$Y_1 = -2x + 11$

$Y_2 = -.5x + 1.8$

$Y_3 = .456x - .456$

$Y_4 = .091x - 3.012$



Label the lines you drew Y_1, Y_2, Y_3, and Y_4 on your sketch above.

Using the CALC function, find the point of intersection for each system of equations listed below: Round to the thousandth.

1. Y1 and Y2: _____

2. Y1 and Y3: _____

3. Y1 and Y4: _____

4. Y2 and Y3: _____

5. Y2 and Y4: _____

6. Y3 and Y4: _____

Answer:

7. How would you use the calculator to graph an equation that is in Standard Form?

_____

8. Try to graph the following equation: $y = -\frac{2}{7}x + 27$ Explain what happened and why.

_____

Word Problems: Systems of Ineq.

Algebra 7.3

You can solve a system of **Inequalities** by graphing word problems.

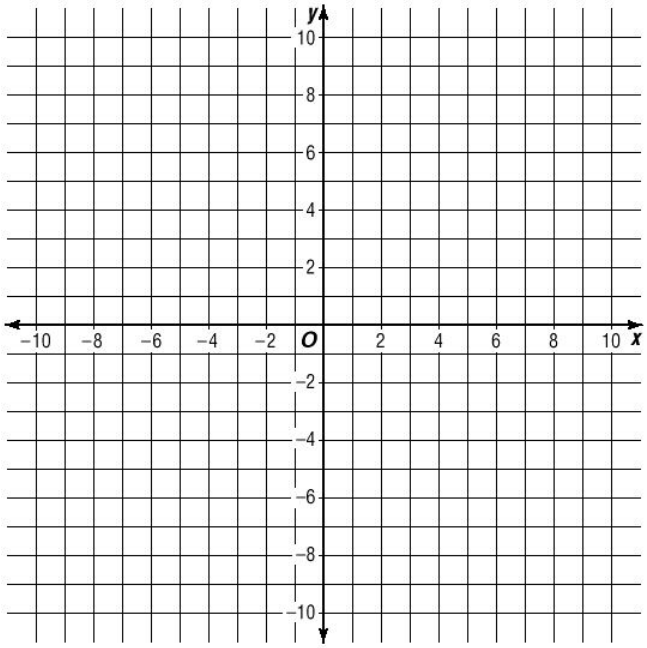
Example:

1. For a fund raiser, you must raise at least $30 by selling cookies for $2 a box, and doughnuts for $5 a box. You must sell more than 10 boxes. Graph a system of inequalities to show all the ways you can do this.

c=cookies **d=**doughnuts

Inequalities: _____

_____

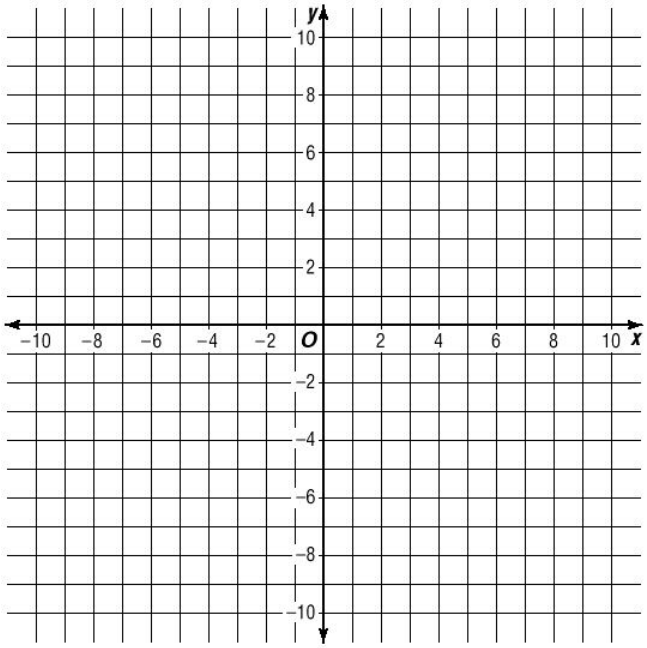


2. Ryan works two jobs. He makes $6 an hour working with his dad and $14 an hour mowing lawns. In one week, he needs to make at least $84 and he only has time to work for a maximum of 10 hours. Graph two inequalities which show all the ways he can do this.

d=hours for dad **m=**mowing hours

Inequalities: _____

_____



Name_____ Period _____

Graphing Inequalities

Algebra 7.6

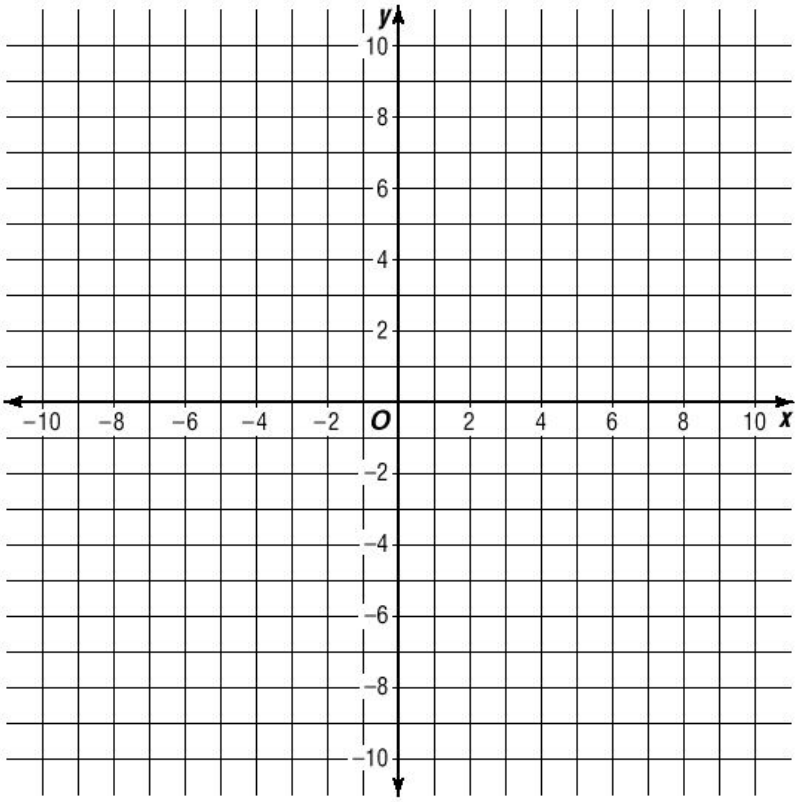
Graph the Following Inequalities:
Solve for y if necessary (Slope-Intercept Form).
Use a solid or dashed line.
Shade the appropriate side.

Graph to the right:

1. $-x + 2y > 8$

and

$3x - 5y > 40$

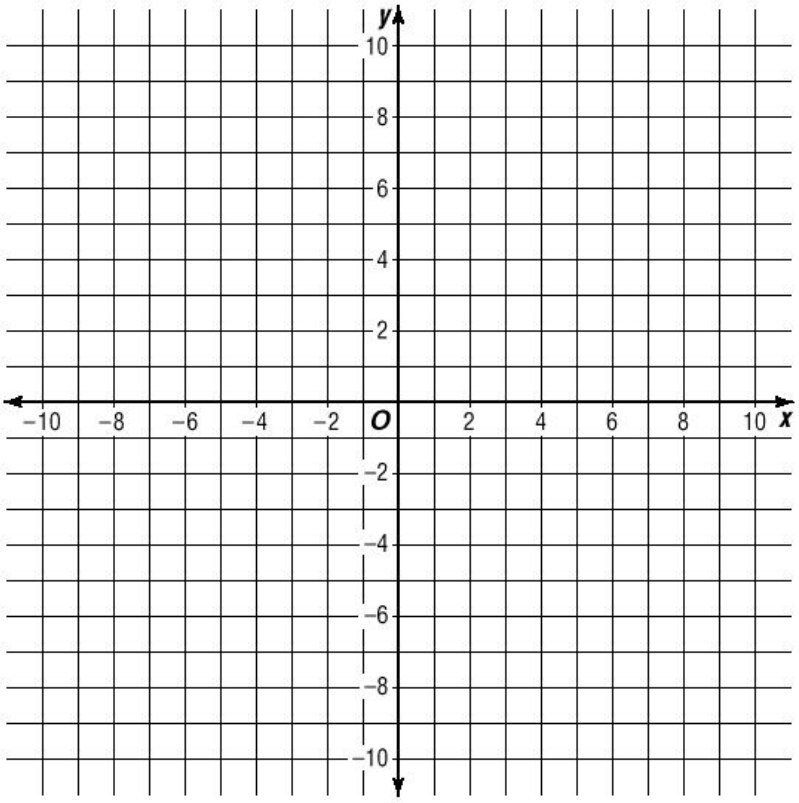


Graph:

2. $y - 2 \geq \frac{2}{5}(x + 10)$

and

$y + 7 < \frac{1}{3}(x + 6)$



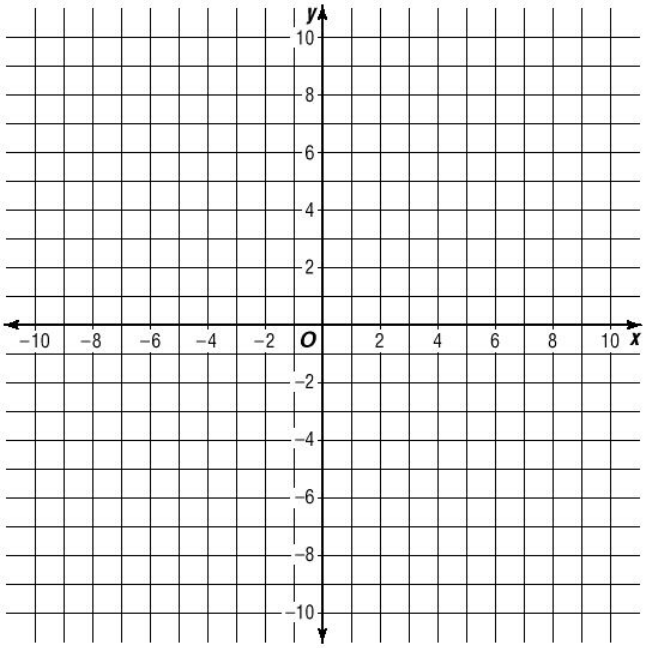
Name_____ Period _____

Graphing Inequalities

Algebra 7.6

Write a system of inequalities for each problem below. Solve and graph each pair of inequalities.

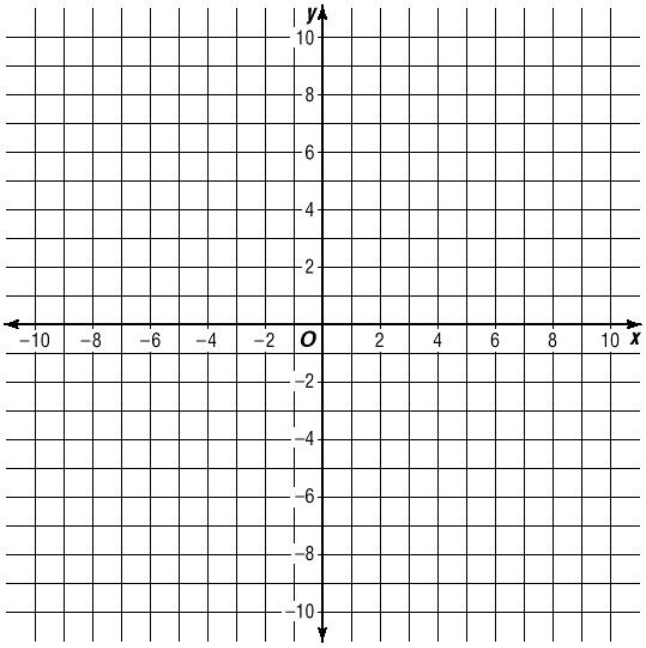
3. Brian needs to buy two types of toys for his cousins' Christmas presents. Toy cars cost $4 and toy action figures cost $8. He wants to buy at least four toys, and he can spend up to $40. Graph the solution and list all the possible combinations of toys he can buy.



Equations: _____

_____

4. Michelle works at two jobs. She makes $4 an hour babysitting, and $6 an hour working at the grocery store. She wants to make more than $48 a week, but she has to work less than 11 hours a week.



Equations: _____

_____

List 3 ways she can work <11 hours and make > $48:

_____

Test Review

Algebra 7.7

Solve each system of equations below using Substitution or Elimination.

100. $3x - 2y = 22$
$x + 2y = -6$

200. $x = -3y$
$3y = -2x + 9$

300. $3x - 2y = -3$
$2x + 3y = -15$

400. $2y + 5x = -15$
$-2x = -3y - 9$

Practice:
Write a system of equations and solve:

500. Kenny sold pens and pencils at his school store. Pencils cost $.25, pens cost $.35. In one morning he made $5.80 selling 20 pens and pencils. How many of each did he sell?

600. A juice company is combining fruit juices. The cranberry juice they are adding is 65% juice. They are mixing 45% apple juice to make 120 gallons of juice. How much of each should be mixed to create a mixture that is 60% juice?

Practice:
300. Use a graphing calculator to solve the system of equations below: (round solution to the thousandth)

$y = 2.215x - 3.14$ **and** $y = .06x + 3.02$

Practice:
1000. Solve using a system of inequalities and graphing.
A small pizza costs $8 and large pizza costs $10. The small pizza uses 4 ounces of dough and the large pizza uses 6 ounces. You have 60 ounces of dough, and you want to sell at least $110 worth of pizzas. What is the greatest number of large pizzas you can make and still make at least $110?

Name_____ Period _____

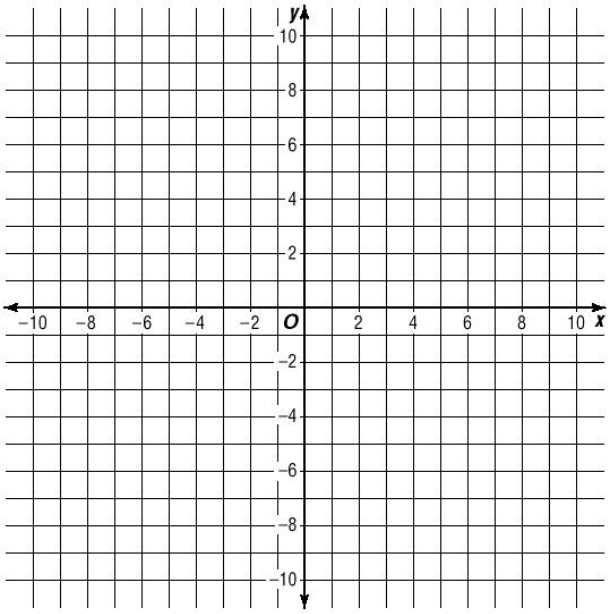
Practice Quiz: Systems

Algebra 7.7

Graph the system of linear equations below to find a solution:

1. $3y = -2x - 24$
   $y = 2x$

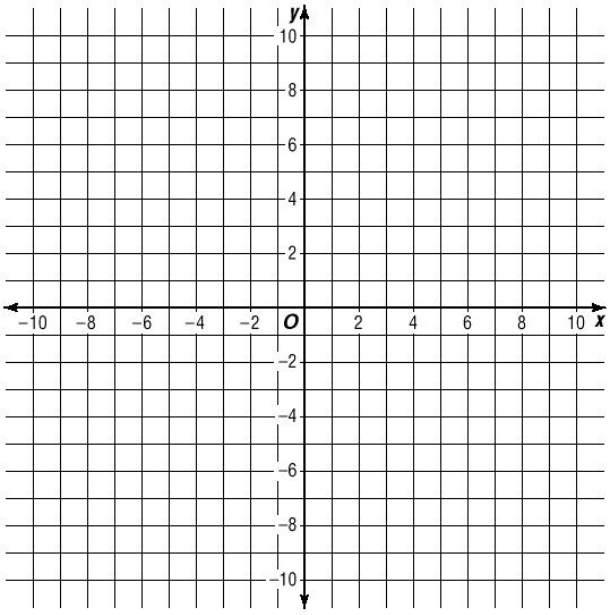
2. $x - y = 13$
   $y = -2x - 1$



Solution 1. _____ Solution 2. _____

Graph the system of inequalities below:

3. $y \leq -2x - 2$
   $y > x + 1$



Solve each system of equations below using substitution, elimination, or a graphing calculator.
(round to the hundredth where applicable)

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

4. _____

5. $y = -3.23x - 9.3$
   $y = .045x + 2.302$

5. _____

Name_____ Period _____

Practice Quiz: Systems

Algebra 7.7

Solve each system of equations below:

5. $4x+3y=3$
$3x+2y=4$

5._____

6. $10=-2y+4x$
$-3=y-3x$

6._____

Solve each:

7. Kayla spent one hour ironing shirts and pants. It takes her 5 minutes to iron a shirt and only 3 to iron a pair of pants. If there were 16 items in the laundry, how many were shirts and how many were pants?

7. **s**=_____ **p**=_____

8. How much of a 15% saltwater solution should be added to a 25% saltwater solution to make a 10-liter solution of 22% saltwater?

8. **15%**_____ **25%**_____

9. A company is mixing a blend of two different coffees. The first kind (**x**) costs $8 a pound, and the second (**y**) costs $5 per pound. How much of each should they use if they want 60 pounds worth $6.25 per pound?

9. **x**=_____ **y**=_____

10. Michelle scored 30 points by making 13 shots from the floor in a basketball game. How many 2 and 3 pointers did she make?

10. **2s**=_____ **3s**=_____

11. In a cage full of bugs, there are beetles (6 legs) and spiders (8 legs). You count 30 bugs and 192 legs. How many spiders and beetles are there?

11. **Spiders**_____ **Beetles**_____

Name_____ Period _____

Practice Quiz: Systems (4)

Algebra

Solve each system of equations below:

5. $4x+3y=3$
   $3x+2y=4$

5._____

6. $10=-2y+4x$
   $-3=y-3x$

6._____

Solve each:

7. Kayla spent one hour ironing shirts and pants. It takes her 5 minutes to iron a shirt and only 3 to iron a pair of pants. If there were 16 items in the laundry, how many were shirts and how many were pants?

7. **s**=_____ **p**=_____

8. In a cage full of bugs, there are beetles (6 legs) and spiders (8 legs). You count 30 bugs and 192 legs. How many spiders and beetles are there?

8. **Spiders**_____ **Beetles**_____

9. A company is mixing a blend of two different coffees. The first kind (**x**) costs $8 a pound, and the second (**y**) costs $5 per pound. How many pounds of each should they use if they want 60 pounds of coffee that costs $375?

9. **x**=_____ **y**=_____

10. Michelle scored 30 points by making 13 shots from the floor in a basketball game. How many 2 and 3 pointers did she make?

10. **2s**=_____ **3s**=_____