

## Agenda

Warm-Up

See Right

HW Check

Card Sort

Which Method?

Homework

#1-10

*read the directions*

## Reminders

Quiz TMR  
4.3 due TMR  
Math Blitz next  
Tues/Thurs IN C-  
HALL!!

## Systems Round-Up

# WARM UP

Watch the music video: take  
some notes on the topic! Have  
HW out ready to check!

### Methods For Solving Systems of Equations

1) Graphing

2) Elimination

3) Substitution



## SOLVING BY GRAPHING

let's practice solving by graphing. don't forget to verify!!

$$\begin{cases} y_1 = \frac{3}{4}x + 1 \\ y_2 = -\frac{1}{2}x - 4 \end{cases}$$

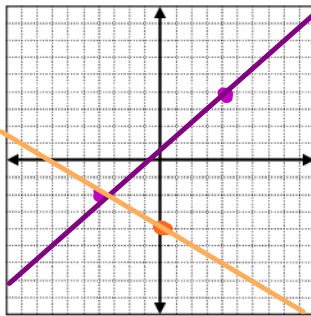
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$$\begin{cases} y = -\frac{3}{4}x + 4 \\ y = x - 3 \end{cases}$$

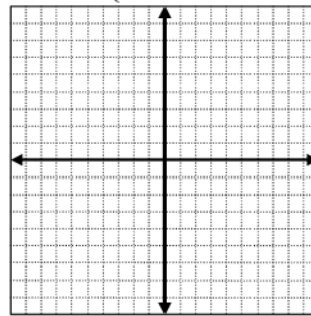
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$$\begin{cases} y = \frac{1}{3}x + 2 \\ x + y = -2 \end{cases}$$

$$y_2 = -x - 2$$

Intersection:  $(-4, -2)$ Solution:  $x = -4$   $y = -2$ 

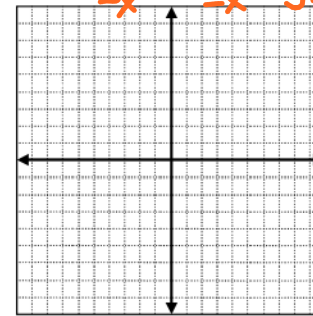
Verify algebraically



Intersection: ( , )

Solution:  $x =$   $y =$ 

Verify algebraically



Intersection: ( , )

Solution:  $x =$   $y =$ 

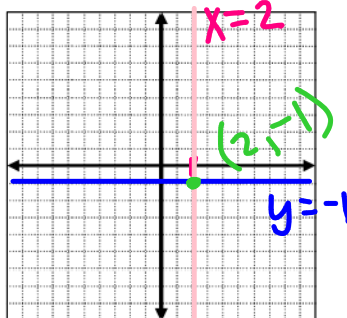
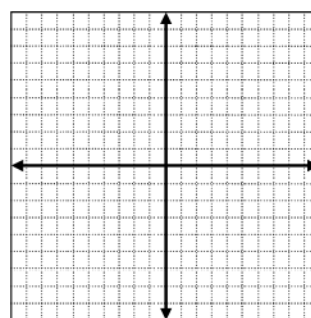
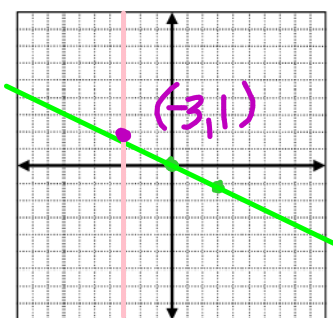
Verify algebraically

$$\begin{cases} y = -1 \\ x = 2 \end{cases}$$

5

$$\begin{cases} y = x + 1 \\ y = x - 4 \end{cases}$$

$$\begin{cases} y = -\frac{1}{3}x \\ x = -3 \end{cases} \text{ vert.}$$

solution:  $x = 2$   $y = -1$ solution:  $x =$   $y =$ solution:  $x = -3$   $y = 1$ 

$H \rightarrow Y$   $V \rightarrow X$   
 $Y = \#$   $X = \#$

## Algebra I - Unit 6: Topic 2 - Solving Systems by Graphing

7 Shelby solved the following system of equations and reported that  $x = 4$  and  $y = 6$ . Solve the system of equations by graphing. Is she correct? Why or why not. Use the table to justify your answer.

$$\begin{aligned} y - x &= 2 \\ 4y &= 8x - 8 \end{aligned}$$

$x$	$y_1$	$y_2$

Each Sureshot needs to hire an electrician to do some repair work at his new home. A-1 Electricians charge \$30 for a service call plus \$45 per hour while Excellent Electricians charge \$40 per hour plus a \$55 service call.

- A) What equation could represent the cost for hiring A-1 Electricians?  $y = 30 + 45x$   
 B) What equation could represent the cost for hiring Excellent Electricians?  $y = 40x + 55$

If the electricians only work for 2 hours, how much will each company charge him?

- C) A-1 Electricians will charge \_\_\_\_\_  
 D) Excellent Electricians will charge \_\_\_\_\_

If the electricians have to work for 8 hours, how much will each company charge C

- E) A-1 Electricians will charge \_\_\_\_\_  
 F) Excellent Electricians will charge \_\_\_\_\_

When will both companies charge the same amount?

- G) For 5 hours, both companies would charge \$255.

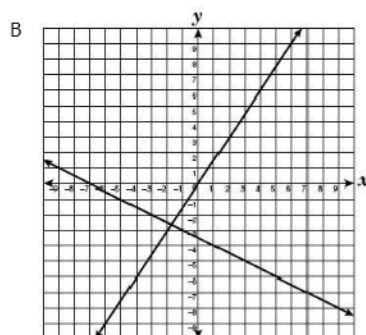
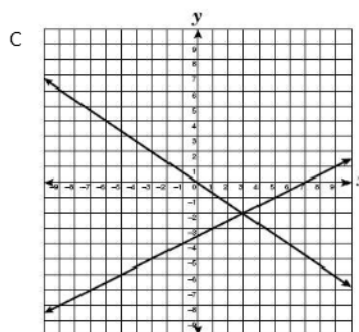
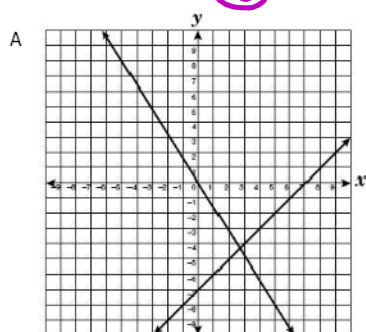
$x$	$y_1$	$y_2$
2	120	135
3	165	175
4	210	215
5	255	255
6	300	295
7	345	335
8	390	375

$x=8$

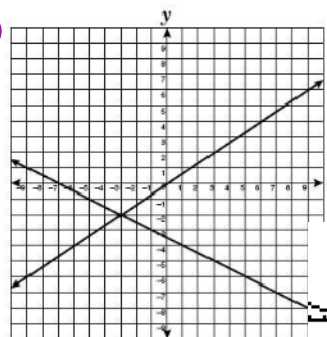
Which graph best represents a solution to this system of equations?

①  $2x - 3y = 0$

②  $x + 2y = -7$



D



Solve for y  
 ①  $2x - 3y = 0$   
 $-2x$   $-2x$

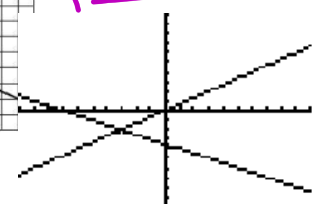
$-3y = -2x$   
 $-3$   $3$

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

②  $x + 2y = -7$   
 $-x$   $-x$

$2y = -x - 7$   
 $2$   $2$   $2$

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



Instructions: Sort the systems cards into the appropriate method used to solve. There is not technically a correct answer for every system, so make sure you can justify how you would solve the system in that manner.



## Substitution

$$x = -3y$$

$$15x - 2y = 94$$

$$y = 6.9x + 12.4$$

$$3.2x + y = 52.8$$

$$y = -3x + 6$$

$$2x + 2y = 67$$

$$4x - 3y = 24$$

$$y = 2x - 10$$

## Elimination

$$x + 2y = 5$$

$$-x + y = 4$$

$$7x + 3y = -1$$

$$4x + y = 3$$

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

$$3x - 4y = 9$$

## Graphing

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

$$y = -x - 4$$

$$y = 2x$$

$$3x + y = 10$$

$$y = -x - 3$$

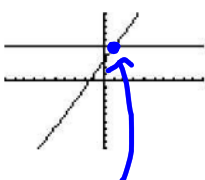
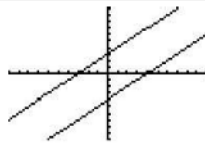
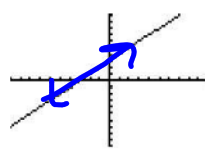
$$y = 2x + 3$$

CHEAT  
SHEET

How Many Solutions to the system?

p. 83

p. 76

Method		One Solution	No Solutions	Infinite Solutions
Graphing	Best to use when:			
	$y = mx + b$ solve for y	Solution is the point of intersection of the lines.	Lines are parallel and do not intersect. same slopes	Lines are identical and intersect at every point
Substitution	Best to use when:	After substituting and simplifying you will be left with	After substituting variables will form zero pairs and will leave you with a FALSE equation	After substituting, variables will form zero pairs and will leave you with a TRUE equation
	$y = -x + 1$ $2x + 3y = 2$	$x = \#$ $y = \#$ Solution will take the form of (x, y)	$2 = 3$	$3 = 3$
Elimination	Best to use when:	After eliminating and simplifying you will be left with	After eliminating, variables will form zero pairs and will leave you with a FALSE equation	After eliminating, variables will form zero pairs and will leave you with a TRUE equation
	Lined up Coefficients of variables are opposites $3x + 4y = 7$ $-3x + 7y = 4$ or can be easily made opposites using multiplication on one $-2(3x + 4y = 7)$ $6x + 7y = 4$ or both rows $-2(3x + 4y = 7)$ $3(2x + 7y = 4)$	$x = \#$ $y = \#$ Solution will take the form of (x, y)	$0 = 3$	$0 = 0$

## Algebra I - Unit 6: Topic 2 – Solving Systems

## Practice – Solving Systems

pp 397-403

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Write which method you would use to solve each system of equations, substitution, elimination, or graphing. Explain in a sentence WHY you would use that method. Then solve one problem of each method (3 total).

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

Graphing, b/c  
2nd eqn is easy  
to solve for y.

2.  $y = \frac{1}{3}x + 17$   
 $8x - y - 6 = 0$

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

4.  $3x - 9y = 12$   
 $-x + 3y = -4$

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

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

7.  $-3y = -15$   
 $x - 2y = -1$

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

9.  $2x - y = -9$   
 $-x - 2y = -8$

10.  $y = -2x + 1$   
 $2x + y = 10$



# SOLVING SYSTEMS HW HELP

Remember, your method of solving can be ANY method - just be able to JUSTIFY why and SHOW how to make the equations fit your method.

You only need to solve THREE problems, with work shown.

1. All real numbers
2. (3, 18)
3. No solution
4. All real numbers
5. (3, 6)
6. (5, -3)
7. (9, 5)
8. (1, 3)
9. (7, 5)
10. No Solution

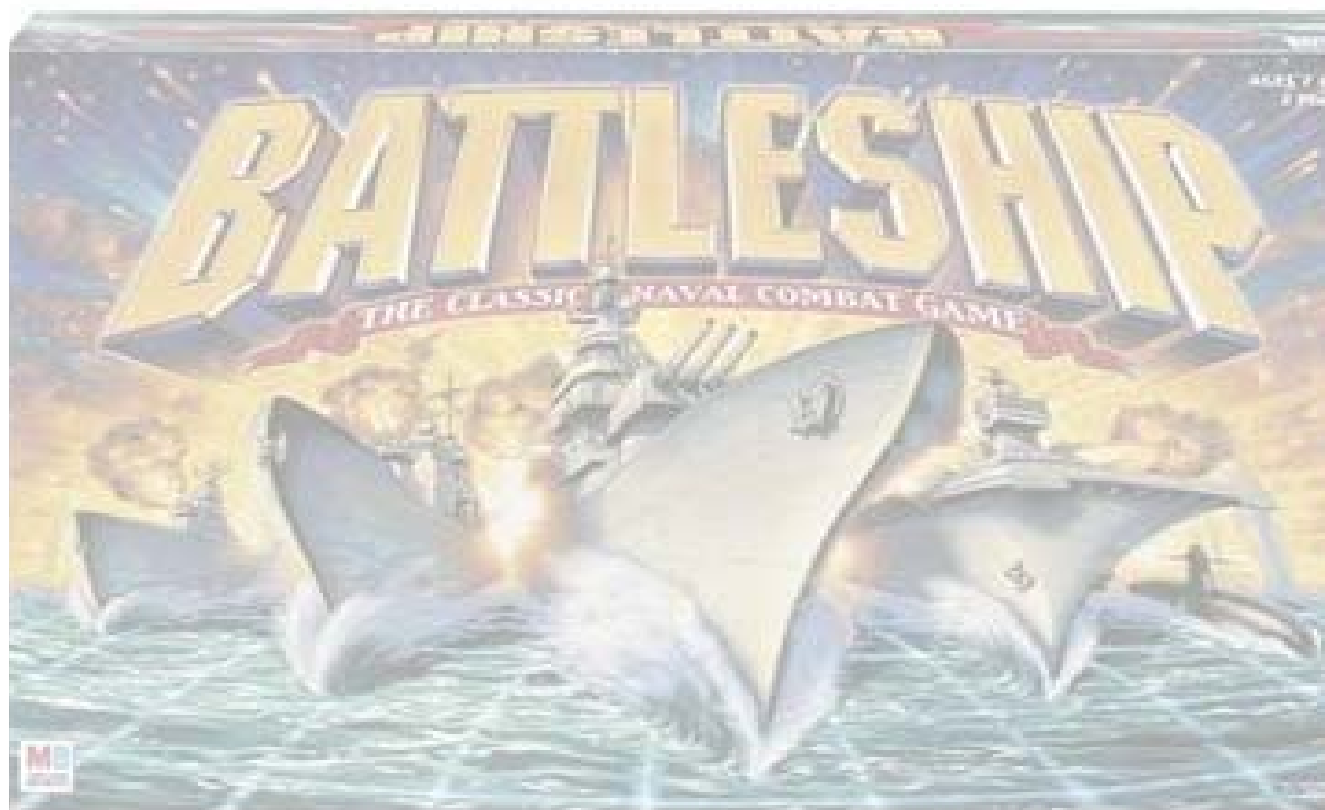
Graphing	<u>Best to use when:</u> Both equations are in slope intercept form: $y = m x + b$	Elimination	<u>Best to use when:</u> Coefficients of variables are opposites $3x + 4y = 7$ $-3x + 7y = 4$ or can be easily made opposites using multiplication on one
	<u>Best to use when:</u> One equation has been solved for a variable. $y = -x + 1$ $2x + 3y = 2$		$-2(3x + 4y = 7)$ $6x + 7y = 4$ or both rows $-2(3x + 4y = 7)$ $3(2x + 7y = 4)$

**Substitution**

**Elimination**

**Graphing**





**GOAL: SINK AS MANY BATTLESHIPS AS POSSIBLE.**

**CHOOSE A STRATEGY (SUBSTITUTION, ELIMINATION, OR GRAPHING)  
TO SOLVE EACH SYSTEM. YOU MUST JUSTIFY YOUR CHOICE!!**

