Have out your graphing calculator!!

Solving Systems by Graphing

Warm Up

1. Determine the number of solutions for the following systems of equations. One, None, or Infinite

a) $y = 3x - 1$
$y = 3x + 6$

parallel — same slopes — none

b) $y = 4x - 7$
$y = 5x - 7$

different slopes — one

2. Which of the following represents the parent function of $y = 5x - 2$?

A. $y = x^2$
B. $y = x - 2$
C. $y = x$
D. $y = 5x - 2$

AGENDA

Warmup: see left
HW Check
Notes: Solve by Graphing p. 82
Hw: Practice #1-9

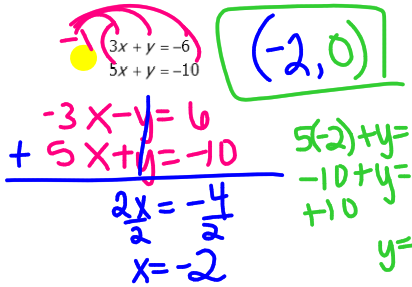
Algebra I - Unit 6: Topic 2 – Solving Systems by Elimination

Practice – Solving Systems by Elimination **pp 397-403**

Name _____ Date _____ Period_____

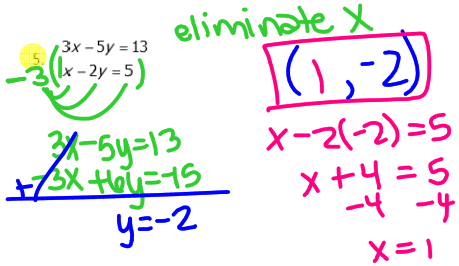
Solve each system by elimination.

1. $2x + y = 3$
   $-2x + 5y = -9$



3. $\frac{1}{2}x - 5y = 30$
   $\frac{1}{2}x + 7y = 6$

4. $5x - 2y = 4$
   $3x + y = 9$



6. $4x + 3y = 9$
   $3x + 4y = 12$

Algebra I - Unit 6: Topic 2 – Solving Systems by Elimination Set Up

7. Three hundred fifty-eight tickets were sold to the school basketball game on Friday. Student tickets were $1.50 and non-student tickets were $3.25. The school made $752.25. How many student and non-student tickets were sold?

Let Statements

8. Naomi took a 40-question history exam. The exam only had multiple-choice questions and short-answer questions. Each multiple-choice question was worth one point; each short-answer question was worth five points; the whole exam was worth 100 points.

A. Which system of equation could be used to solve for m, the number of multiple-choice questions, and s, the number of short-answer questions?

A $\begin{cases} 5m+s=40 \\ m+s=100 \end{cases}$

B $\begin{cases} m+s=40 \\ 5m+s=100 \end{cases}$

C $\begin{cases} s+m=40 \\ 5s+m=100 \end{cases}$

D $\begin{cases} 5s+m=40 \\ s+m=100 \end{cases}$

B. Solve the system that you selected in part A.

9. Karrie and Amy were shoulder partners. They both worked the same problem, but got two different answers. Who is incorrect and explain the error they made?

Karrie:

$x+y=-3$ ⟶ $x+y=-3$

$3x+y=3$ ⟶ $-(3x+y=3)$

$-2x=0$

$x=0$

When she solved for x, Karrie got $x=0$

Amy:

$x+y=-3$ ⟶ $x+y=-3$

$3x+y=3$ ⟶ $-(3x+y=3)$

$-2x=-6$

$x=3$

When she solved for x, Amy got $x=3$

$x+y=-3$

$3x+y=3$

$x+y=-3$

$-3x-y=-3$

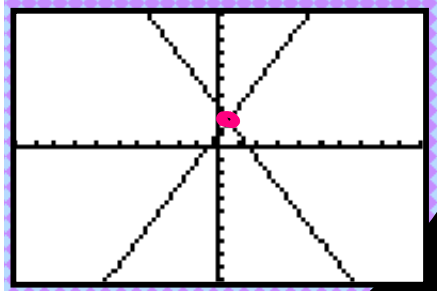
$-2x=-6$

Essential Question: How do I find the intersection point of a system?

GRAPHING p.82

Recall...

Where is the solution here?



SOLUTION

is a point (x,y) where the lines intersect.

Does a system of equations always have a solution? Why or why not?

NO, they could be parallel

Essential Question:

How do I find the intersection point of a system?

Use the table on the calculator to determine if the ordered pair is a solution to the system of equations.

1. **Solution**

Solve for y= to use calculator

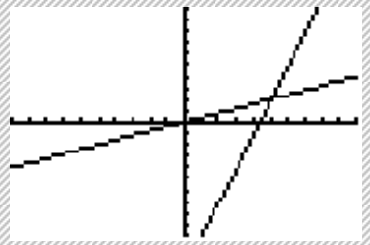
(5,2) Yes

$y_1 = \frac{2}{5}x$ $y_2 = 3x - 13$

fraction → ALPHA Y=

2nd GRAPH

x	y1	y2
3	6/5	−4
4	8/5	−1
6	12/5	5

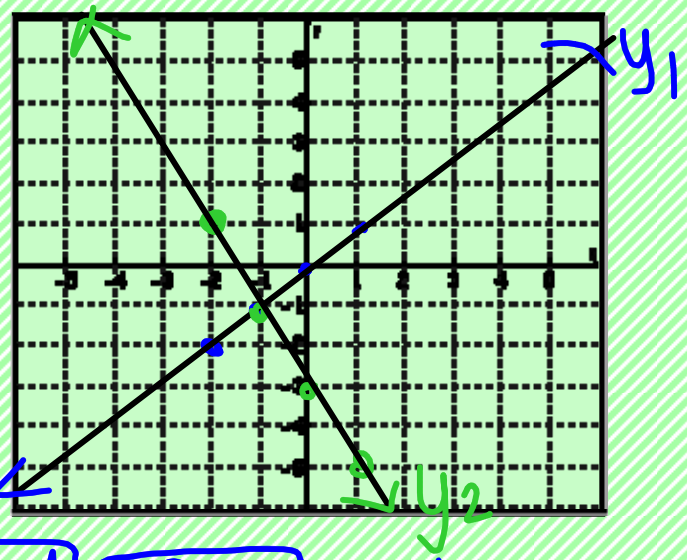


$y_1 = y_2$ → solution

Essential Question:
How do I find the intersection point of a system?

Solve the systems BY GRAPHING!

2.



$y_1 = x$

$y_2 = -2x - 3$

x	y1	y2
-2	-2	1
-1	-1	-1
0	0	-3
1	1	-5

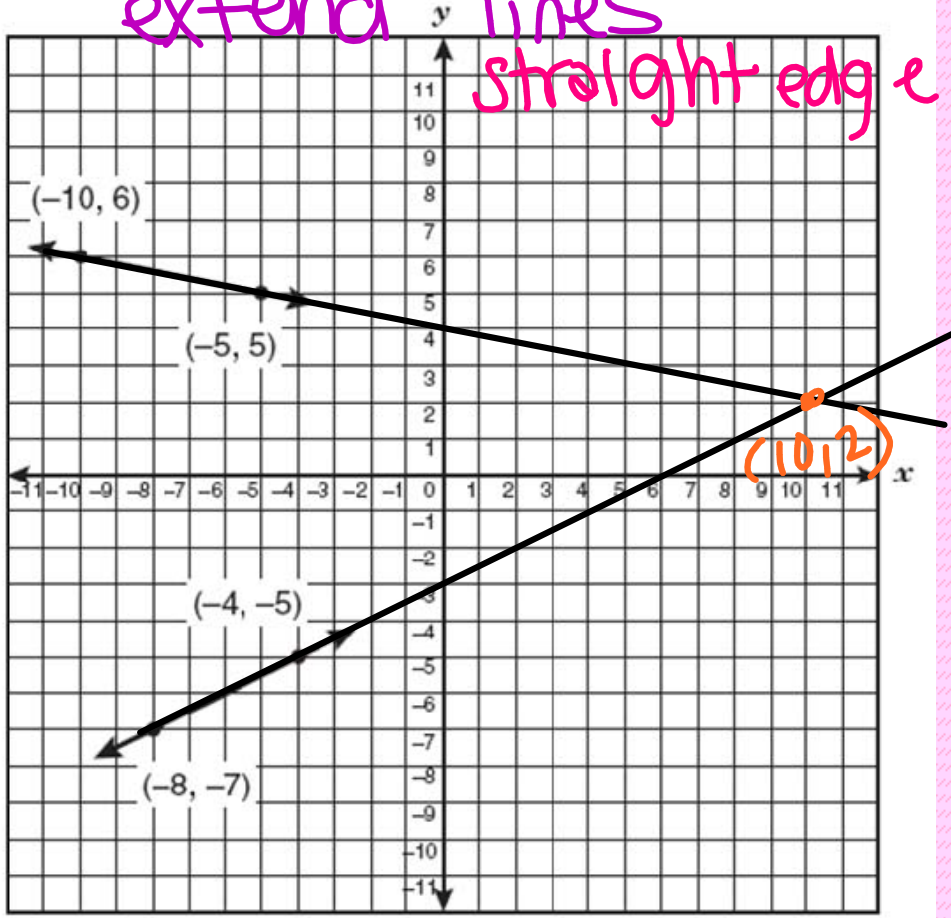
2nd TRACE 5: intersect
ENTER x3

SOLUTION: $(-1, -1)$

STEPS!

The graph of a system of linear equations is shown below

extend lines
straight edge



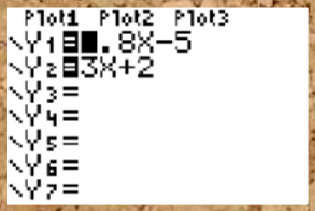
Which of the following is the solution to this system of linear equations?

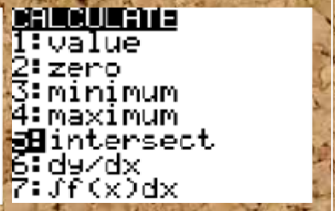
A (0, 4) B (8, 1) C (0, -3) D (10, 2)

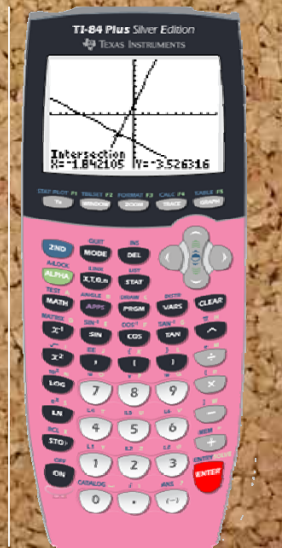
Using The Calculator

To solve a system of equations by graphing using the calculator:

- both equations need to be in slope-intercept form (y=mx+b)
- Enter each equation into *y* = on your calculator
- **Press Graph.** Make sure your check your viewing window! You need to see BOTH equations.
- Press **2nd TRACE, then 5,** intersection.
- Follow the directions on the screen



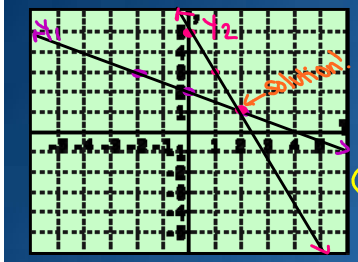




Find the solution set to the following equations. If there is not a solution, write No Solution

SOLVE FOR y!

4.



$x + 2y = 4$

$2x + y = 5$

① $x+2y=4$ $-x$ $-x$

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

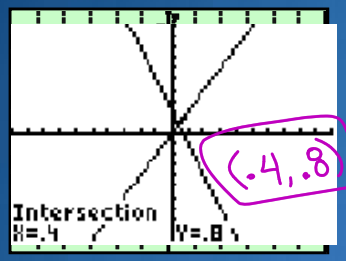
$y_1 = \frac{-x}{2} + 2$

② $2x+y=5$ $-2x$ $-2x$

$y_2 = -2x+5$

(2,1)

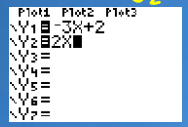
5.



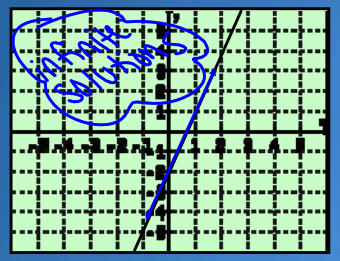
$y_1 = -3x + 2$

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

$y_2 = 2x$



6.



Solve for y!

$3x - y = 2$

$12x - 4y = 8$

$y_1 = 3x-2$

$y_2 = 3x-2$

SAME!!

7 The RHS soccer team is selling snapback hats as a fundraiser. They contacted two companies. Hats Off charges a $50 design fee and $5 per hat. Top Stuff charges a $25 design fee and $6 per hat.

A) Write a system of equations that represents each company!

Let Statement

Let h be number of hats.

Let y be total price.

HATS OFF $y = 50 + 5h$

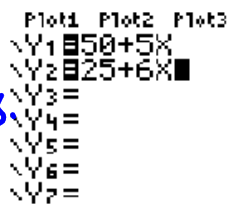
TOP STUFF $y = 25 + 6h$

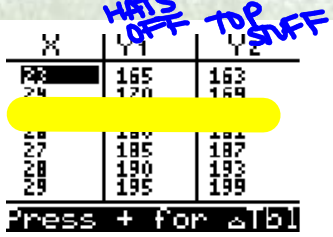
B) For how many hats will the cost be the same? What is the cost? 25 hats, $175

C) Explain when it is cheaper for the soccer team to use Top Stuff and when it is cheaper to use Hats Off.

Top stuff when you order less than 25 hats.

Hats off when you order more than 25 hats.



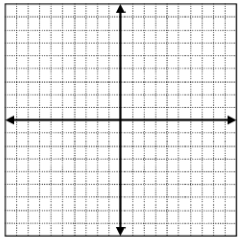


#1-9

SOLVING BY GRAPHING

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

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

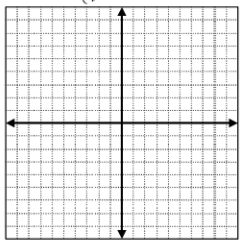


Intersection: (,)

Solution: x = y =

Verify algebraically

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

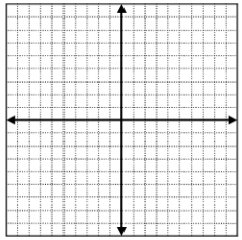


Intersection: (,)

Solution: x = y =

Verify algebraically

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

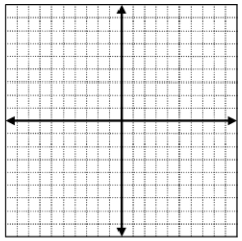


Intersection: (,)

Solution: x = y =

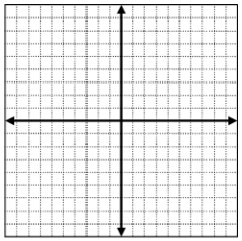
Verify algebraically

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



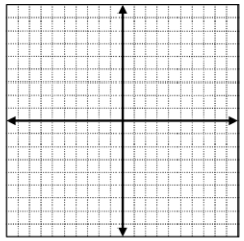
solution: x = y =

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



solution: x = y =

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



solution: x = y =

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.

$$y - x = 2$$
$$4y = 8x - 8$$

x	y_1	y_2

8. Coach 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? _____
B) What equation could represent the cost for hiring Excellent Electricians? _____

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 _____

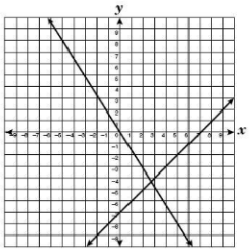
If the electricians have to work for 8 hours, how much will each company charge Coach Sureshot?
E) A-1 Electricians will charge _____
F) Excellent Electricians will charge _____

When will both companies charge the same amount?
G) For _____ hours, both companies would charge _____.

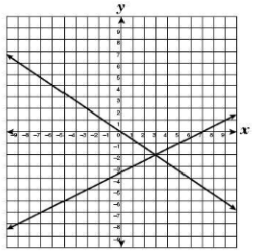
9. Which graph best represents a solution to this system of equations?

$$2x - 3y = 0$$
$$x + 2y = -7$$

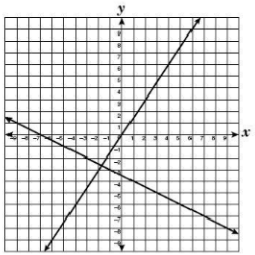
A



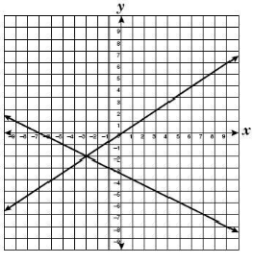
C



B



D



Solving Systems by Graphing HW Help

Remember:

Solve all equations for y so you can type them into y=. To verify algebraically, plug in your x & y values to the original equations and make sure they make true statements. Your graphs should be PRECISE (use the table on the calculator if necessary).

1. (-4,2) 2. (4,1) 3. (-3,1)

4. HOY VUX!

5. These lines are parallel - what does that mean about the solution?

6. (-3, 1)

7. Yes - show the table!

8. A. y = 30 + 45x and y = 55 + 40x

9. D

USING THE CALCULATOR

- both equations need to be in slope-intercept form (y=mx+b)
- Enter each equation into *y* = on your calculator
- **Press Graph.** Make sure your check your viewing window! You need to see BOTH equations.
- Press **2nd TRACE, then 5,** intersection.
- ENTER ENTER ENTER

HW check

1 - 6 must have

correct graph sketched

1. (-4, -2)
2. (4, 1)
3. (-3, 1)
4. (2, -1)
5. No solution
6. (-3, 1)

13. Yes, she is correct.

x	y_1	y_2
1	3	0
2	4	2
3	5	4
4	6	6
5	7	8

14. A) $y = 30 + 45h$
    B) $y = 40h + 55$
    C) \$120
    D) \$135
    E) \$390
    F) \$375
    G) 5, \$255
15. D