

**Algebra I, Module 5, Lesson 9 – Solving Systems of Equations with Graphs  
Extra Problems**

Example 1. Which is the x-value of the solution to this pair of linear equations?

$$\begin{aligned}5y - 2x &= 6 \\ 3x - 2y &= 13\end{aligned}$$

- A 3
- B 5
- C 7
- D 8

This is such a mean question. First the question only wants the x-value so you can't check the answer choices until we find the one that works. Second the equation is written  $By + Ax = C$ .

Here are the steps to solve this problem.

1. You'll solve each equation for y.
2. You'll graph both equations on the calculator.
3. You'll find the x-value of the intersection.

Copy the problem and solve.

Step 1: You'll solve each equation for y.

What did you get for  $5y - 2x = 6$ ?

$$y = \frac{2}{5}x + \frac{6}{5}$$

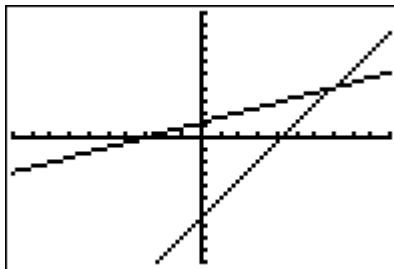
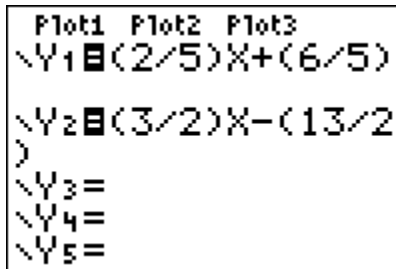
Problems? Go here. <http://prezi.com/w3sl4jefzbcS/standard-form-to-slope-intercept-3-systems/>

What did you get for  $3x - 2y = 13$ ?

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

Problems? Go here. <http://prezi.com/begpxpmbwp4d/standard-form-to-slope-intercept-4-systems/>

Step 2: You'll graph both equations on the calculator. Check here for your Y= and graph screen.

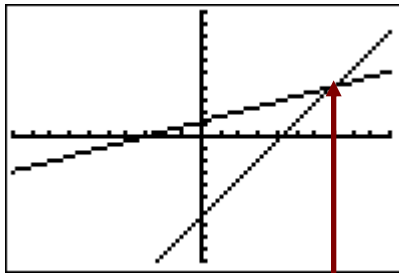


Step 3: You'll find the x-value of the intersection.

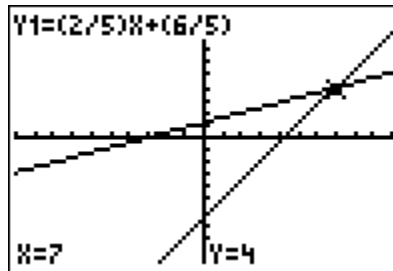
Which is the x-value of the solution to this pair of linear equations?

$$\begin{aligned} 5y - 2x &= 6 \\ 3x - 2y &= 13 \end{aligned}$$

- A 3
- B 5
- C 7
- D 8



It looks like they intersect @  $x = 7$



Press the TRACE key. Type 7. ENTER

X	Y1	Y2
2	2.4	-3.5
3	2.8	-2.5
4	3.2	-1.5
5	3.6	-0.5
6	4.0	0.5
7	4.4	1.5
8	4.8	2.5
9	5.2	3.5
10	5.6	4.5

X=8

Go to the table. When  $x = 7$ ,  $y = 4$  in both column. That's the only time that happens.

But remember, you can always check your solutions into the graphing calculator by substituting.

If you think the intersection is  $(7, 4)$  use your calculator to check, that the equations are true when you substitute.

$$\begin{aligned} 5y - 2x &= 6 \\ 3x - 2y &= 13 \end{aligned}$$

$5(4) - 2(7)$	6
$3(7) - 2(4)$	13

They are true!

## Example 2

At a pet store the total cost of 8 pounds of Brand X dog food and 1 pound of Brand Y dog food is \$8.40, including tax. The total cost of 16 pounds of Brand X dog food and 8 pounds of Brand Y dog food is \$24.00, including tax. What is the price per pound of Brand Y dog food?

- A \$0.90
- B \$1.20
- C \$2.60
- D \$4.08

You'll write the system of equations together as a review of the earlier lesson. Then you're on your own.

You need to break up the information.

Equation 1 comes from:

*total cost of 8 pounds of Brand X dog food and 1 pound of Brand Y dog food is \$8.40*

Equation 2 comes from:

*total cost of 16 pounds of Brand X dog food and 8 pounds of Brand Y dog food is \$24.00*

### Equation 1

You have to pick out the mathematical words and translate them to mathematical symbols.

You need to translate these important words below.

Copy the words and phrases and translate them to math symbols in your TAKE NOTES section.

To check your work, highlight the boxes below.

total	Add. But we don't know what we're adding yet.
8 pounds of x	8x.
and	Add. This goes with the word <i>total</i> .
1 pound of y	1y.
is	=.
8.40	8.40.

Put your answers together to write an equation

$$8x + y = 8.40$$

### Equation 2

*total cost of 16 pounds of Brand X dog food and 8 pounds of Brand Y dog food is \$24.00*

This is exactly like the first equation. Write the equation that represents the sentence:

$$16x + 8y = 24.00$$

Now, solve the system of equations.

$$\begin{cases} 8x + y = 8.40 \\ 16x + 8y = 24 \end{cases}$$

Step 1: You'll solve each equation for  $y$ .

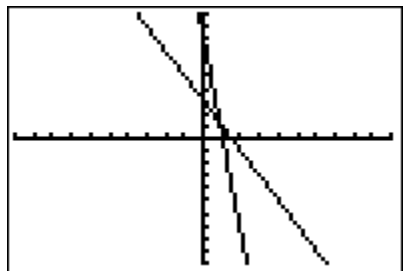
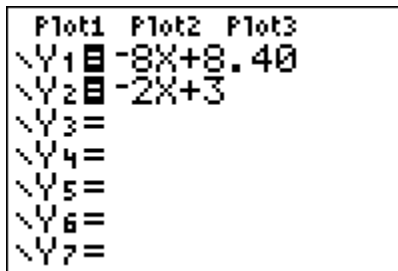
What did you get for  $8x + y = 8.40$ ?

$$y = -8x + 8.40$$

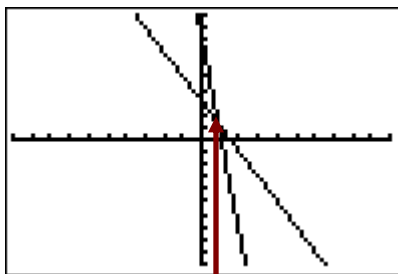
What did you get for  $16x + 8y = 24$ ?

$$y = -2x + 3$$

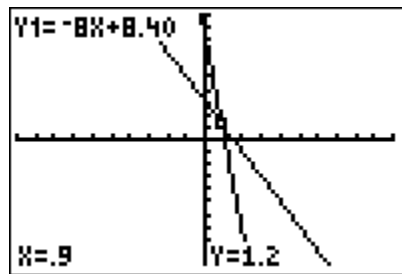
Step 2: You'll graph both equations on the calculator.



Step 3: You'll find the  $x$ -value of the intersection. What does it look like on your calculator?



It looks like they intersect @  $x < 1$



Press the TRACE key. Type 0.9. ENTER  
I'm pretty sure I'm right.

So what is the answer? Is it going to be A, B, C, or D?

**A** \$0.90 Correct The other answers are too far off.