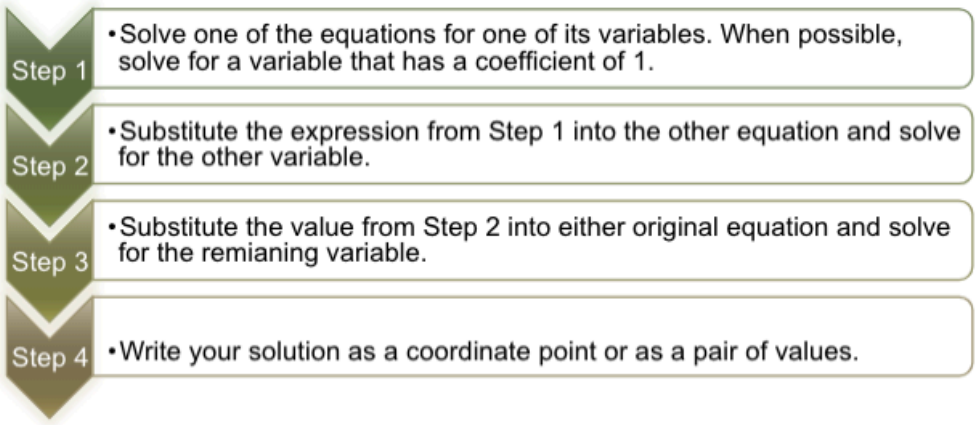
Write your questions here!

Name: _____

[8.2: SOLVING SYSTEMS BY SUBSTITUTION] 1

We have learned how to solve linear systems by graphing. Now we will learn how to solve the linear systems by using a method called . . . . . .

Steps for Solving Linear Systems by Substitution



Example 1: Solve the linear system using substitution:

$$4x + 6y = 4$$
$$x = -6 + 2y$$

Step 1: Solve one of the equations for one of its variables.

Step 2: Now, substitute the expression from **Step 1** into the OTHER equation and solve.

Step 3: Next, substitute the value from **Step 2** into either of the original equations and solve for the last unknown variable.

Step 4: Write your solution as a coordinate point or as a pair of values.

Write your questions here!

8.2: SOLVING SYSTEMS BY SUBSTITUTION

More Examples:

2. $y = -7 - 3x$
   $-2x + 4y = 0$

3. $x = 2y + 5$
   $x = 10 - 3y$

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

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

Special Cases:

$-16x + 2y = -2$
$y = 8x - 1$

$2x - 5y = -24$
$5y = 2x$

Now, summarize your notes here!

Solve each system by substitution.

1) $4x - 4y = -4$
$y = -4x + 1$

2) $y = 2x - 7$
$2x - 4y = 10$

3) $8x + 5y = -24$
$y = 5x + 15$

4) $y = -4x - 5$
$6x - 5y = -1$

5) $y = 4x - 24$
$-3x - 5y = -18$

6) $y = 4x - 17$
$4x + 4y = 12$

7) $x = -1 - 3y$
$2x - 4y = -22$

8) $-x + 3y = 4$
$x = 4y - 3$

9) $4x + y = -3$
$-7x - 3y = 9$

10) $x = 5y - 11$
$-9x - 7y = -5$

11) Is the point (-1, 3) a solution of the system of linear equations below?

$x + y = 2$
$y - x = 2$

12) Is the point (1, 7) a solution of the system of linear equations below?

$2x - 4 = 5$
$x = 1$

SKILLZ REVIEW

Coming Up: Evaluate each expression if a = 4, b = -2, c = 10, x = -3 and y = -5.		
1. a^2a^4	2. a^6	3. a^8
Quick Review: Find the equation of the line that passes through the given points.		
1. (-2, 3); (4, 3)	2. (-5, 3); (-5, 9)	3. (-1, 3); (0, 2)

8.2 Applications

Solve the systems of equations.

1. $-10x - 2y = -1$
   $y = -5x + 2$

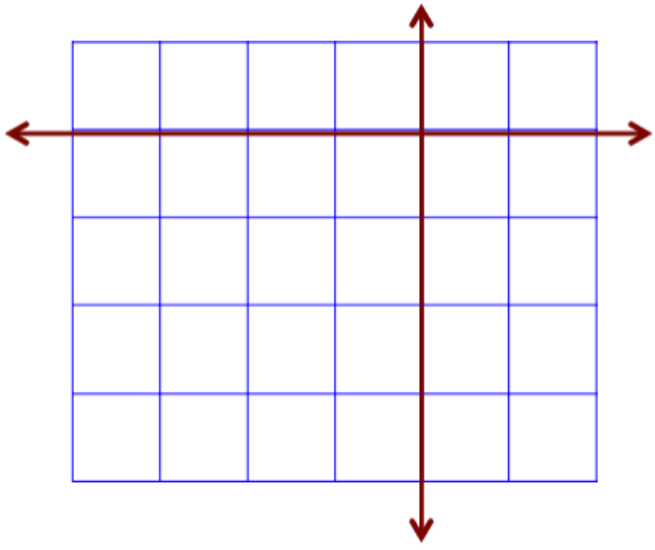
2. $-24x - 3y = -18$
   $y = -8x + 6$

3. Solve the following systems of equations by graphing AND by substitution!!

$y - 2x = -1$

$y = -3 - 2x$

Solve by Graphing:



Solution:_____

Solve by Substitution:

Solution:_____

Which method did you find easier? Justify your choice.

4. The sum of two numbers is negative nine. Their difference is one. What are the numbers?

Let...

Eq 1:

Eq 2:

5. The sum of two numbers is 70. One number is ten more than twice the other number. Find the numbers.

Let...

Eq 1:

Eq 2:

6. The width of a rectangle is 1 meter less than three times its length. If its perimeter is 62 meters, find the area of the rectangle. (Hint: P = 2L + 2W)

Let...

Eq 1:

Eq 2:

7. 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.

Let...

Eq 1:

Eq 2:

8. Some students want to order shirts with their school logo. One company charges $9.65 per shirt plus a setup fee of $43. Another company charges $8.40 per shirt plus a $58 fee. For what number of shirts would the cost be the same?

Let...

Eq 1:

Eq 2:

Which company should you order from if you only want to buy 6 shirts? Explain.

How about 35 shirts? Explain.

9. The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 1 van and 6 buses with 372 students. High School B rented and filled 4 vans and 12 buses with 780 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

Let...

Eq 1:

Eq 2:

10. The state fair is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 8 vans and 8 buses with 240 students. High School B rented and filled 4 vans and 1 bus with 54 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

Let...

Eq 1:

Eq 2:

**This is 1 nut and 1 bolt attached to each other.

11. How many nails will balance one nut in Illustration 7?

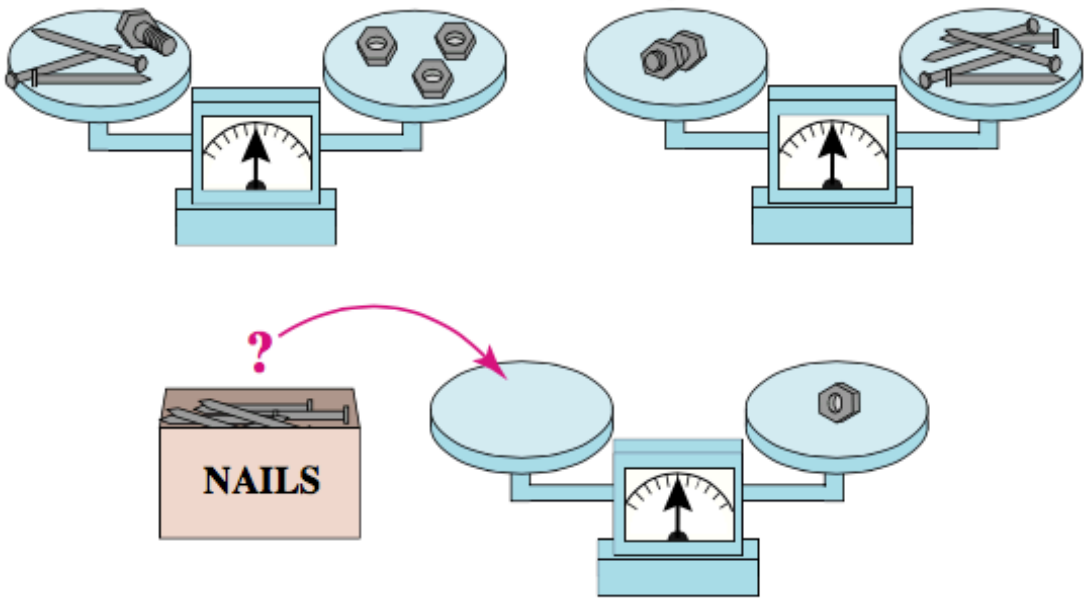


ILLUSTRATION 7

Let...

Eq 1:

Eq 2: