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NOTES: Section 3.2 – Solve Linear Systems Algebraically

Goals: #1 - I can solve a system of linear equations using substitution.

#2 - I can solve a system of linear equations using elimination.

#3 - I can determine whether a system of equations has one, infinitely many, or no solutions when using substitution or elimination.

#4 - I can determine one method, substitution or elimination, works more conveniently than the other.

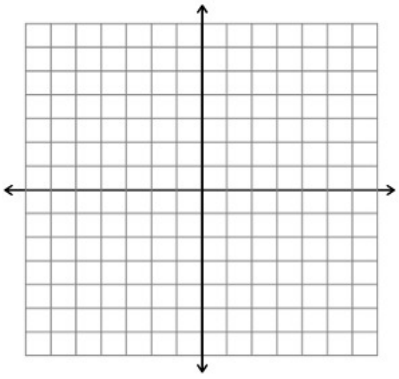
Homework: Lesson 3.2 Worksheet

Warm Up:

Solve the system of equations graphically. Then classify the system as *consistent and independent, consistent and dependent,* or *inconsistent*.

1. $3x + 2y = 12$

   $x - y = -1$

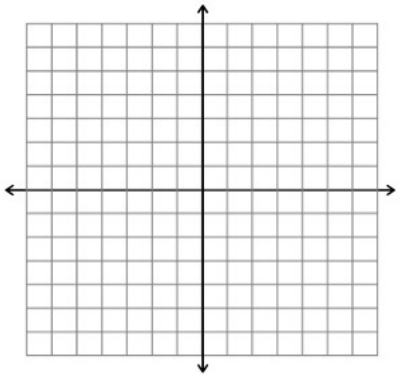


Solution: _____

Classify: _____

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

   $-2x - y = 6$



Solution: _____

Classify: _____

Notes:

There are two algebraic methods for solving linear systems:

_____ and_____

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Example #1: Solve the system using the substitution method.

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

b. $x + 4y = 1$
$3x + 2y = -12$

Example #2: Solve the system using the elimination method.

a. $3x - 7y = 10$
$6x - 8y = 8$

b. $4x - 2y = -16$
$-3x + 4y = 12$

Notes:

We can use either method when solving systems algebraically. In general,

- _____ is convenient when one of the variables has a coefficient of _____ or _____.

- _____ is convenient when *neither* variable has a coefficient of _____ or _____.

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Review:

We know that when we solve linear systems, we could have _____ solution, _____ solution, or _____ solutions.

What does this look like algebraically?

ONE SOLUTION **NO SOLUTION** **INFINITELY MANY SOLUTIONS**

Example #3: Solve the linear system.

a. $x - 2y = 4$

$3x - 6y = 8$

b. $4x - 10y = 8$

$-14x + 35y = -28$

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Example #4: You need a 15% acid solution for your science experiment, but there's only 10% solution and 30% solution left. You decide to mix the 10% solution with the 30% solution to make your own 15% acid solution. You need a total of 10 liters of 15% solution for your science experiment. How many liters of the 10% solution and the 30% solution should you use?