

Name: _____

Date: _____

SYSTEMS LESSON 4: THE METHOD OF **elimination**

Today's lesson will build on the previous one and formally introduce the technique of solving a system by **elimination**. Remember from the last lesson that:

SOLUTIONS TO SYSTEMS REMAIN SOLUTIONS IF

1. Properties of equality are used to rewrite either of the equations.
2. The equations are added or subtracted or any rewrite is added or subtracted.

Example

If using CALC trick...

① $3y + 2x = 6$

$2x + 3y = 6$

② $5y - 2x = 10$

$-2x + 5y = 10$

We can eliminate the x-variable by addition of the two equations.

$$\begin{array}{r} 3y + 2x = 6 \\ + 5y - 2x = 10 \\ \hline = 8y = 16 \\ y = 2 \end{array}$$

$\frac{8y = 16}{8} = \frac{16}{8}$
 $y = 2$

$3y + 2x = 6$
 $3(2) + 2x = 6$
 $6 + 2x = 6$
 $-6 \quad -6$
 $\frac{2x}{2} = \frac{0}{2}$
 $x = 0$

The value of y can now be substituted into either of the original equations to find the value of x

$$\begin{array}{l} 3y + 2x = 6 \\ 3 \cdot 2 + 2x = 6 \\ 6 + 2x = 6 \\ x = 0 \end{array}$$

The solution of the linear system is (0, 2).

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THE METHOD OF ELIMINATION!

HOMEWORK - Solve at least 7 by Elimination.

1. Solve each of the following systems by the Method of Elimination. These two should be relatively easy. Make sure to understand why.

(a) $x - y = 7$

$x + y = 5$

(b) $2x + 5y = 3$

$-2x - y = 5$

↓
Circle that one.

$x =$

$y =$

2. Solve each of the following systems by the Method of Elimination. These will be slightly harder than #1 because you will have to alter one of the equations by multiplication.

(a) $x - y = 15$

$4x + 2y = 30$

(b) $2x + 3y = 17$

$5x + 6y = 32$

3. Solve each of the following systems by the Method of Elimination. In each case you will likely want to alter both equations by multiplication.

(a) $2x + 3y = 16$

$$5x - 2y = 21$$

(b) $6x - 7y = 25$

$$15x + 3y = 42$$

4. Which of the following represents the intersection of the lines whose equations are given below?

(1) $(-1, 16)$

(3) $(3, 8)$

$$y + 2x = 14$$

(2) $(4, 9)$

(4) $(0, 7)$

$$y - x = 5$$