Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment

Find the solution of the following systems by elimination and determine if it is an independent, inconsistent or dependent system

1. $\begin{cases} 2x + y = 3 \\ 5x - 2y = 4 \end{cases}$

2. $\begin{cases} 2x + 3y = 14 \\ x + 2y = 9 \end{cases}$

3. $\begin{cases} 7x + 2y = 16 \\ -21x - 6y = 24 \end{cases}$

4. $\begin{cases} 4x - 3y = 18 \\ y + 2 = 0 \end{cases}$

5. $\begin{cases} -3x - 2y = -12 \\ y = 5x - 7 \end{cases}$

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

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

8. $\begin{cases} 5x + 2y = 8 \\ x - y = 4 \end{cases}$

9. $\begin{cases} 2x + 4y = -6 \\ x = 1 - 2y \end{cases}$

10. $\begin{cases} 5x - 2y = 1 \\ x + 4y = 8 \end{cases}$

Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment

ANSWERS

Find the solution of the following systems by elimination and determine if it is an independent, inconsistent or dependent system

1.

I. 2x + y = 3 and II. 5x – 2y = 4

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

$$\begin{cases} -5(2x + y = 3) \\ 2(5x - 2y = 4) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other

Applying distributive property:

$$\begin{cases} -10x - 5y = -15 \\ 10x - 4y = 8 \end{cases}$$

The result would be:

$$-9y = -7 \qquad \rightarrow y = \frac{7}{9}$$

Now, we calculate the value of variable "x" by substituting the result of "y" into one of the equations

$$x = \frac{3 - y}{2} = \frac{3 - \frac{7}{9}}{2} = \frac{10}{9}$$

Solution (10/9, 7/9). Independent System

2.

I. 2x +3 y = 14 and II. x + 2y = 9

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "y" coefficients of both equations, like follows:

$$\begin{cases} -2(2x + 3y = 14) \\ 3(x + 2y = 9) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other

Applying distributive property:

Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment

$$\begin{cases} -4x - 6y = -28 \\ 3x + 6y = 27 \end{cases}$$

The result would be:

$$-x = -1 \qquad \rightarrow x = 1$$

Now, we calculate the value of variable "y" by substituting the result of "x" into one of the equations

$$y = \frac{9 - x}{2} = \frac{9 - 1}{2} = 4$$

Solution (1, 4). Independent System

3.

I. 7x + 2y = 16 and II. -21x - 6y = 24

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

$$\begin{cases} 21(7x + 2y = 16) \\ 7(-21x - 6y = 24) \end{cases}$$

As both coefficients have different signs, we do not have to assign a negative sign to one of the coefficients so they can eliminate each other.

Applying distributive property:

$$\begin{cases} 147x + 42y = 336 \\ -147x - 42y = 168 \end{cases}$$

The result would be:

$$0 = 504$$

No Solution. Inconsistent System

4.

I. 4x -3y = 18 and II. y + 2 = 0

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "y" coefficients of both equations, like follows:

Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment

$$\begin{cases} 1(4x - 3y = 18) \\ 3(2 + y = 0) \end{cases}$$

As both coefficients have different signs, we do not have to assign a negative sign to one of the coefficients so they can eliminate each other.

Applying distributive property:

$$\begin{cases} 4x - 3y = 18 \\ 6 + 3y = 0 \end{cases}$$

The result would be:

$$4x + 6 = 18 \qquad \rightarrow x = \frac{18 - 6}{4} = 3$$

The value of y is calculated from equation II

$$2 + y = 0 \quad \rightarrow y = -2$$

Solution (3, -2). Independent System

5.

I. -3x -2y = -12 and II. y = 5x -7

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

$$\begin{cases} -5(-3x - 2y = -12) \\ 3(-5x + y = -7) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other

Applying distributive property:

$$\begin{cases} 15x + 10y = 60 \\ -15x + 3y = -21 \end{cases}$$

The result would be:

$$13y = 39 \qquad \rightarrow y = 3$$

Now, we calculate the value of variable "x" by substituting the result of "y" into one of the equations

$$x = \frac{y + 7}{5} = \frac{3 + 7}{5} = \frac{10}{5} = 2$$

Solution (2, 3). Independent System

Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment

6.

I. -3x + 3y = 4 and II. –x + y= 3

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

$$\begin{cases} -1(-3x+3y=4) \\ 3(-x+y=3) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other

Applying distributive property:

$$\begin{cases} 3x-3y=-4 \\ -3x+3y=9 \end{cases}$$

The result would be:

$$0=5$$

No Solution. Inconsistent System

7.

I. x = 3y - 1 and II. 3x - y = 2

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

$$\begin{cases} 3(x-3y=-1) \\ -1(3x-y=2) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other

Applying distributive property:

$$\begin{cases} 3x-9y=-3 \\ -3x+y=-2 \end{cases}$$

The result would be:

$$-8y=-5 \qquad \rightarrow y=\frac{5}{8}$$

Now, we calculate the value of variable "x" by substituting the result of "y" into one of the equations

Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment

$$x = -1 + 3y = -1 + 3\left(\frac{5}{8}\right) = \frac{7}{8}$$

Solution (7/8, 5/8). Independent System

8.

I. 5x + 2y = 8 and II. x - y = 4

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

$$\begin{cases} 1(5x + 2y = 8) \\ -5(x - y = 4) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other.

Applying distributive property:

$$\begin{cases} 5x + 2y = 8 \\ -5x + 5y = -20 \end{cases}$$

The result would be:

$$7y = -12 \qquad \rightarrow y = -\frac{12}{7}$$

Now, we calculate the value of variable "x" by substituting the result of "y" into one of the equations

$$x = 4 + y = 4 - \frac{12}{7} = \frac{16}{7}$$

Solution (16/7, -12/7). Independent System

9.

I. 2x + 4y = -6 and II. x = 1 -2y

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment

$$\begin{cases} 1(2x+4y=-6) \\ -2(x+2y=1) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other

Applying distributive property:

$$\begin{cases} 2x+4y=-6 \\ -2x-4y=-2 \end{cases}$$

The result would be:

$$0=-8$$

No Solution. Inconsistent System

10.

I. 5x - 2y = 1 and II. x + 4y = 8

We interchange the "x" or "y" coefficients from equation I and equation II to eliminate one of the variables. In this case, we are going to interchange the "x" coefficients of both equations, like follows:

$$\begin{cases} 1(5x-2y=1) \\ -5(x+4y=8) \end{cases}$$

As both coefficients have the same sign, we have to assign a negative sign to one of the coefficients so they can eliminate each other.

Applying distributive property:

$$\begin{cases} 5x-2y=1 \\ -5x-20y=-40 \end{cases}$$

The result would be:

$$-22y=-39 \qquad \rightarrow y=\frac{39}{22}$$

Now, we calculate the value of variable "x" by substituting the result of "y" into one of the equations

$$x=\frac{1+2y}{5}=\frac{1+2\left(\frac{39}{22}\right)}{5}=\frac{10}{11}$$

Solution (10/11, 39/22). Independent System

Name: _____ Period: _____ Date: _____

SOLVING LINEAR SYSTEMS USING ELIMINATION Assignment