VI Solving a System of Linear Equations

Date:*11/19-20/2014*

Topic VI: Systems Of Linear Equations & Inequalities in One & Two Variables

3rd Class

Objective: the students will

- *Apply the concepts to Solve system of equation.* **Using The elimination or combination Method**

Agenda:

Bell ringer

vocabulary:

Examples : **Topic V Resources**

Class work: **Topic V Resources**

Closing Activity : ***Exit Ticket***

Homework

Linear Combination Method

Use the linear combination method to solve the system of linear system.

1. $x+2y=5$

$3x-2y=7$

$4x=12$

$\frac{4x}{4}=\frac{12}{4}$

$x=3$

$(3)+2y=5$

$-3 \qquad -3$

$2y=2$

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

$y=1$

$(3,1)$

Linear Combination Method

Use the linear combination method to solve the system of linear system.

2. $x + y = 1$ $\xrightarrow{3}$ $3x + 3y = 3$

$2x - 3y = 12$ $\longrightarrow$ $2x - 3y = 12$

$$5x = 15$$

$$\frac{5x}{5} = \frac{15}{5}$$

$$x = 3$$

$$(3) + y = 1$$

$$-3 \qquad -3$$

$$y = -2$$

$$(3, -2)$$

Linear Combination Method

Use the linear combination method to solve the system of linear system.

3. $x - y = -4$

$-x + 2y = 5$

$-3y = -9$

$-3 \quad -3$

$y = 3$

$x - (3) = -4$

$+3 \quad +3$

$x = -1$

$(-1, 3)$

The Elimination Method

Solve the linear system using the linear combination method.

4. $2x - 3y = 5$ $\xrightarrow{3}$ $6x - 9y = 15$

$-6x + 9y = 12$ $\longrightarrow$ $-6x + 9y = 12$

$0 = 27$

No Solution

The Elimination Method

Solve the linear system using the linear combination method.

5. $6x - 3y = -3$ $\xrightarrow{-4}$ $-24x + 12y = 12$

$8x - 4y = -4$ $\xrightarrow{3}$ $24x - 12y = -12$

$0 = 0$

Infinitely Many

Writing and Using a Linear System

6. An pharmacy mailed 300 advertisements, smaller ads requiring $.33 postage and larger ads requiring $.55 postage. If the total cost of postage was $154, find the number of advertisements mailed at each rate.

$$s + l = 300 \xrightarrow{\text{-.33}} -.33s - .33l = -99$$

$$.33s + .55l = 154 \longrightarrow .33s + .55l = 154$$

$$.22l = 55$$

$$\frac{.22l}{.22} = \frac{55}{.22}$$

$$l = 250$$

$$s + (250) = 300$$

$$-250 \quad -250$$

$$s = 50$$

50 small ads

250 large ads

Writing and Using a Linear System

6. An pharmacy mailed 320 advertisements, smaller ads requiring $.33 postage and larger ads requiring $.55 postage. If the total cost of postage was $121, find the number of advertisements mailed at each rate.

$$s + l = 320 \xrightarrow{\text{-.33}} -.33s - .33l = -105.6$$

$$.33s + .55l = 121 \longrightarrow .33s + .55l = 121$$

$$.22l = 15.4$$

$$\frac{.22l}{.22} = \frac{15.4}{.22}$$

$$l = 70$$

$$s + (70) = 320$$

$$-70 \quad -70$$

$$s = 250$$

250 small ads

70 large ads

Class work 3rd Class Topic VI

Name:_____ date:_____

1. $2x - y = 1$
   $6x - 3y = 12$

2. $9x + 2y = 0$
   $3x - 5y = 17$

3. $4x + 5y = 13$
   $3x + y = -4$

4. $2x - 5y = -4$
   $4x + 3y = 5$

5. $11x + 6y = 1$
   $3x + 2y = -3$

6. $4x - 2y = 6$
   $2x - y = 3$

7. $2x + 3y = 6$
   $6x + 9y = 18$

A Linear System with No Solutions

Choose a method to solve the linear system and tell how many solutions the system has.

1. $2x - y = 1$

$6x - 3y = 12$

-3 →

$-6x + 3y = -3$

$6x - 3y = 12$

$0 = 9$

The Elimination Method

Solve the linear system using the linear combination method.

$$2.\quad 9x+2y=0$$
$$3x-5y=17$$

$$9x+2y=0$$
$$\xrightarrow{-3}\quad -9x+15y=-51$$
$$17y=-51$$
$$\frac{17y}{17}=\frac{-51}{17}$$
$$y=-3$$

$$9x+2(-3)=0$$
$$9x-6=0$$
$$+6\quad +6$$
$$9x=6$$
$$\frac{9x}{9}=\frac{6}{9}$$
$$x=\frac{2}{3}$$

$$\left(\frac{2}{3},-3\right)$$

The Elimination Method

Solve the linear system using the linear combination method.

3. $4x + 5y = 13$

$3x + y = -4$

$3(-3) + y = -4$

$-9 + y = -4$

$+9 \qquad +9$

$y = 5$

$4x + 5y = 13$

-5 → $-15x - 5y = 20$

$-11x = 33$

$\frac{-11x}{-11} = \frac{33}{-11}$

$x = -3$

$(-3, 5)$

The Elimination Method

Solve the linear system using the linear combination method.

$$4 \quad 2x - 5y = -4 \xrightarrow{-2} -4x + 10y = 8$$

$$4x + 3y = 5 \longrightarrow 4x + 3y = 5$$

$$13y = 13$$

$$\frac{13y}{13} = \frac{13}{13}$$

$$y = 1$$

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

$$2x - 5 = -4$$

$$+5 \quad +5$$

$$2x = 1$$

$$\frac{2x}{2} = \frac{1}{2}$$

$$x = \frac{1}{2}$$

$$\left(\frac{1}{2}, 1\right)$$

The Elimination Method

Solve the linear system using the linear combination method.

5. $11x+6y=1$

$3x+2y=-3$

$3(5)+2y=-3$

$15+2y=-3$

$-15 \quad -15$

$2y=-18$

$\frac{2y}{2}=\frac{-18}{2}$

$y=-9$

$11x+6y=1$

$\xrightarrow{-3}$ $-9x-6y=9$

$2x=10$

$\frac{2x}{2}=\frac{10}{2}$

$x=5$

$(5,-9)$

A Linear System with Many Solutions

Choose a method to solve the linear system and tell how many solutions the system has.

6. $4x - 2y = 6$

$2x - y = 3$

/-2 →

$-2x + y = -3$

$2x - y = 3$

$0 = 0$

A Linear System with Many Solutions

Choose a method to solve the linear system and tell how many solutions the system has.

7. $2x + 3y = 6$

$6x + 9y = 18$

$\xrightarrow{\text{-3}}$ $-6x - 9y = -18$

$6x + 9y = 18$

$0 = 0$

Exit ticket 3rd Class Topic VI

Name:_____ date:_____

1. Choose a method to solve the linear system. Explain your choice.

a. $2x - y = 3$

$x + 3y = 5$

b. $4x + 4y = 16$

$-2x + 5y = 9$

c. $4x + 6y = 12$

$6x + 9y = 18$

d. $2x + 6y = 6$

$x + 3y = -3$

2. For a community bake sale, you purchased 12 pounds of sugar an 15 pounds of flour. Your total cost was $7.95. The next day, at the same prices you purchased 4 pounds of sugar and 10 pounds of flour. Your total cost the second day was $3.90. Find the cost per pound of sugar and flour purchases.

Choosing a Solution Method

1. Choose a method to solve the linear system. Explain your choice.

a. $2x - y = 3$

$x + 3y = 5$

Solve for x

$x + 3y = 5$

$-3y \quad -3y$

$x = -3y + 5$

Substitute in for x

$2(-3y + 5) - y = 3$

$-6y + 10 - y = 3$

$-10 \quad -10$

$-7y = -7$

$\frac{-7y}{-7} = \frac{-7}{-7}$

$y = 1$

$x = -3(1) + 5$

$x = -3 + 5 = 2$

$(2,1)$

Choosing a Solution Method

1. Choose a method to solve the linear system. Explain your choice.

b. $4x+4y=16$ /2 $\rightarrow$ $2x+2y=8$

$-2x+5y=9$ $\rightarrow$ $-2x+5y=9$

$7y=17$

$\frac{7y}{7}=\frac{17}{7}$

$y=\frac{17}{7}$

$4x+4\left(\frac{17}{7}\right)=16$

$4x+\frac{68}{7}=\frac{112}{7}$

$-\frac{68}{7}\quad -\frac{68}{7}$

$\frac{1}{4}(4x=\frac{44}{7})\frac{1}{4}$

$x=\frac{11}{7}$

$\left(\frac{11}{7},\frac{17}{7}\right)$

A Linear System with Many Solutions

Choose a method to solve the linear system and tell how many solutions the system has.

c. $4x + 6y = 12$

$6x + 9y = 18$

/-2 → $-2x - 3y = -6$

/3 → $2x + 3y = 6$

$0 = 0$

A Linear System with No Solutions

Choose a method to solve the linear system and tell how many solutions the system has.

d. $2x + 6y = 6$

$x + 3y = -3$ $\xrightarrow{-2}$ $-2x - 6y = 6$

$2x + 6y = 6$

$0 = 12$

Solving a Cost Problem

2. For a community bake sale, you purchased 12 pounds of sugar an 15 pounds of flour. Your total cost was $7.95. The next day, at the same prices you purchased 4 pounds of sugar and 10 pounds of flour. Your total cost the second day was $3.90. Find the cost per pound of sugar and flour purchases.

$$12s + 15f = 7.95$$
$$4s + 10f = 3.90$$

$$4s + 10(0.25) = 3.90$$
$$4s + 2.5 = 3.90$$
$$-2.5 \quad -2.5$$
$$4s = 1.40$$
$$\frac{4s}{4} = \frac{1.40}{4}$$
$$s = 0.35$$

$$12s + 15f = 7.95$$
$$-3 \rightarrow -12s - 30f = -11.70$$
$$-15f = -3.75$$
$$\frac{-15f}{-15} = \frac{-3.75}{-15}$$
$$f = 0.25$$

$0.35 per lb for sugar

$0.25 per lb for flour