Notes 6-3

Sec 1 H | Solving Systems of Equations using Elimination | Unit 6

Warm-up:

Find the solution to the system of equations.

1.

$x + 3y = -17$

$y = 3x + 1$

$x + 3(3x+1) = -17$

$x + 9x + 3 = -17$

$10x + 3 = -17$

$-3 \quad -3$

$\frac{10x}{10} = \frac{-20}{10}$

$x = -2$

$y = 3(-2) + 1$

$-6 + 1$

$(-2, -5)$

2.

$7x + y + 1 = 1$

$y = -7x$

3.

$y = 7x + 2$

$y = 6x + 5$

Zero Pairs:

What does it take to add up to zero?

Ex. 1: $5 + a = 0$

$a = -5$

Ex. 3: $-14 + d = 0$

$d = 14$

Common Denominators:

What is the common denominator for the given fractions?

Ex. 3: $\frac{1}{2}, \frac{2}{6}$ (3·)

$\frac{3}{6}, \frac{2}{6}$

Ex. 5: $\frac{3}{4}, \frac{5}{6}$ (3·, 2·)

$\frac{9}{12}, \frac{10}{12}$

Ex. 6: $\frac{1}{5}, \frac{2}{7}$

Elimination Method

Step 1: Choose a variable to get rid of

Step 2: Make a zero pair for the #s in front of the variable (common denom.)

Step 3: Multiply each equation, by the needed #, to make zero pair

Step 4: Add the equations together.

Step 5: Two options
- Plug in and solve for other variable
- Get rid of other variable

Solve the system of equations using elimination.

Ex. 7:

$$\begin{array}{r} -9x-5y=17 \\ +\ 9x+2y=4 \\ \hline -3y=21 \end{array}$$

$\frac{-3y}{-3} = \frac{21}{-3}$

$y = -7$

$9x + 2(-7) = 4$

$9x - 14 = 4$

$+14 \quad +14$

$9x = 18$

$x = 2$

$(2, -7)$

Solve each system of equations by elimination.

Ex. 8:
$x + y = 1$
$+ \quad x + y = 3$

$2x = 4$

$x = 2$

$2 + y = 3$
$-2 \quad -2$

$y = 1$

$(2, 1)$

Ex. 9:
$3x + 4y = 19$
$-1(3x + 6y = 33)$

$3x + 4y = 19$
$+ \quad -3x - 6y = -33$

$-2y = -14$

$y = 7$

$3x + 4(7) = 19$

$3x + 28 = 19$
$\quad -28 \quad -28$

$\frac{3x}{3} = \frac{-9}{3}$

$x = -3$

$(-3, 7)$

Solve each system of equations by elimination.

Ex. 10:

$3x+2y=46$

$-3(x+5y=11)$

$3x+2y=46$

$+\ -3x-15y=-33$

$-13y=13$

$y=-1$

$x+5(-1)=11$

$x-5=11$

$x=16$

$(16,-1)$

Ex. 11:

$2(4x-3y=-13)$

$3(5x+2y=1)$

$8x-6y=-26$

$+\ 15x+6y=3$

$23x=-23$

$x=-1$

$5(-1)+2y=1$

$-5+2y=1$

$2y=6$

$y=3$

$(-1,3)$

Solve each system of equations by elimination.

Ex. 12:

$$\begin{cases} x+y=8 \\ x+y=-1 \end{cases}$$

-1

$x+y=8$

$+\ -x-y=1$

$0 \neq 9$

No Sol

Ex. 13:

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

2

$4x+2y=8$

$-4x-2y=-8$

$0=0$

∞ Many