

Solving Systems of Equations by Elimination

Review

The three possibilities for solutions of a system of equations is Linear infinite solutions, no solution or one solution

If there is one solution, the answer will be a point (x, y)

The methods for solving we know so far are Graphing and Substitution

Solving Systems of Equations by Elimination

To use the elimination method, we will ~~either~~ Combine the two equations in order to eliminate one of the variables.

***Sometimes, we may need to rewrite one of the equations so the variables line up!

Ex 1) $x + 2y = 7$
 $+ 3x - 2y = -3$

 $4x = 4$
 $x = 1$
(1, 3)

$x + 2y = 7$
 $-1 + 2y = 7$

 $2y = 6$
 $\frac{2y}{2} = \frac{6}{2}$
 $y = 3$

Ex 2) $2x + 8y = -42$
 $8y = x - 63$

$2(7) + 8y = -42$
 $14 + 8y = -42$
 -14

 $8y = -56$
 $\frac{8y}{8} = \frac{-56}{8}$
 $y = -7$
(7, -7)

$2x + 8y = -42$
 $+x - 8y = +63$

 $3x = 21$
 $\frac{3x}{3} = \frac{21}{3}$
 $x = 7$

Ex 3) $-x + 3y = 5$
 $+ -x - 3y = 1$

 $+2x = 6$
 $\frac{+2x}{2} = \frac{6}{2}$
 $x = 3$
(-3, 2/3)

$-x + 3y = 5$
 $-(-3) + 3y = 5$
 $3 + 3y = 5$
 $3y = 2$
 $\frac{3y}{3} = \frac{2}{3}$
 $y = \frac{2}{3}$

Ex 4) $-3x = -2y$
 $-3x + 5y = 9$

$-3x = -2(3)$
 $-3x = -6$
 $\frac{-3x}{-3} = \frac{-6}{-3}$
 $x = 2$
(2, 3)

$Ax + By = C$
 $-3x + 2y = 0$
 $+3x + 5y = 9$

 $7y = 9$
 $\frac{7y}{7} = \frac{9}{7}$
 $y = \frac{9}{7}$

Notice:

- We add the equations when coefficients are _____.
- We subtract the equations when coefficients are _____.