7.3-7.5 Study Guide Quiz Answer Key

7.3 – 7.4: Solve Systems of Equations by Eliminating a Variable:

- Be able to add or subtract equations to eliminate a variable in order to solve a system

Ex: $4x - 3y = 5$
$+\quad -2x + 3y = -7$

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

$x = -1$

Ex: $6x - 4y = 14$
$-\quad 3x - 4y = 1$

$\frac{3x}{3} = \frac{13}{3}$

$x = \frac{13}{3}$ or $4\frac{1}{3}$

After plugging x into either equation, you would get the value for y.

$y = -3$ $\qquad$ $y = 3$

$(-1, -3)$ $\qquad$ $(\frac{13}{3}, 3)$

Ex: $3x + 4y = -6$
$2y = 3x + 6$

First you have to rewrite the equations so they are lined up. The first equation stays the same, you will subtract $3x$ in the second equation.

$3x + 4y = -6$
$+\ -3x + 2y = 6$ Now add the equations together

$\frac{6y}{6} = \frac{0}{6}$

$y = 0$ Plug y into either equation to get $x = -2$

$(-2, 0)$

- Be able to multiply equations first, then eliminate a variable, in order to solve a system

Ex: $x + y = 2$
$2x + 7y = 9$

Multiply the first equation by 2. Now x matches.

$2x + 2y = 4$
$-\ 2x + 7y = 9$

Subtract the equations from each other

$\frac{-5y}{-5} = \frac{-5}{-5}$

$y = 1$

Ex: $4x - 3y = 8$
$5x - 2y = -11$

Multiply the top equation by 2 and multiply the bottom equation by 3. *Y* matches now.

$8x - 6y = 16$
$-\ 15x - 6y = -33$

$\frac{-7x}{-7} = \frac{49}{-7}$

$x = -7$

Plug the value of the variable into any equation to find the other value.

$x = 1$ $\qquad$ $y = -12$

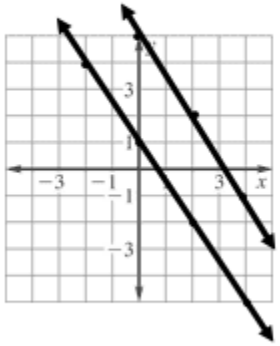
$(1, -1)$ $\qquad$ $(-7, -12)$

7.5: Special Types of Linear Systems:

- Be able to identify when a system of equations has one solution, no solution or an infinite number of solutions by solving using any method.

Ex: Solve by graphing: $3x + 2y = 10$

$y = -\frac{3}{2}x + 1$



No solution, the lines are parallel so they will never intersect.

Ex: Solve by substitution:

$x - 2y = -4$

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

Infinite solutions

Ex: Solve by eliminating:

$2x - 3y = 6$

$2x - 3y = -4$

No solution

- Be able to identify the number of solutions to a system without actually solving it.

Ex: $5x + 3y = 6$
$-5x - 3y = 3$

Ex: $y = 2x - 4$
$-6x + 3y = -12$

You must first put both equations in slope-intercept form:

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

$y = -\frac{5}{3}x - 1$

$y = 2x - 4$ (Already in slope-intercept form)

$y = -4 + 2x$ (when you put it in slope-intercept)

In the first example, since the slopes are the same and y-intercepts are different, then you can say that the lines are parallel, meaning they will never intersect so there is no solution.

In the second example, both the slopes and the *y*-intercepts are the same, so they are the same line, so there is an infinite number of solutions.