Are You The Solution?

7.3 Solving Linear Systems by Linear Combinations

Goals: • Use linear combinations to solve a system of linear equations.

EQ: What are the steps to solve by elimination?

(Linear Combinations)

Vocabulary

Linear combinations: (Elimination)

Book Defn: an equation is obtained by adding 1 equation to another

used to solve a system by combining the equations using addition

Opposite Term: $3x, -3x$

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

Example 1: Using Addition

Solve the linear system.

$$7x + 2y = -6 \longrightarrow 7(0) + 2y = -6$$

$$+ \; 5x - 2y = 6$$

$$\dfrac{12x}{12} = \dfrac{0}{12}$$

$$\boxed{x = 0}$$

$$\dfrac{2y}{2} = \dfrac{-6}{2}$$

$$\boxed{y = -3}$$

$(0, -3)$ $5(0) - 2(-3) = 6$

$6 = 6 ✓$

∴ yes, $(0, -3)$ is soln

Use linear combinations to solve the system of linear equations. Then check your solution.

a) $4x + y = -4$

$+ \ -4x + 2y = 16 \longrightarrow -4x + 2(4) = 16$

$\dfrac{3y}{3} = \dfrac{12}{3}$

$-4x + 8 = 16$

$\underline{-8 \quad -8}$

$\boxed{y = 4}$

$\dfrac{-4x = 8}{-4 \quad -4}$

$\boxed{x = -2}$

$(-2, 4)$

$4(-2) + 4 = -4$

$-4 = -4 \checkmark$

$\therefore yes$
$(-2, 4)$
is soln

b) $4x + 3y = 10 \longrightarrow 4(1) + 3y = 10$

$+ \ 12x - 3y = 6$

$4 + 3y = 10$

$\underline{-4 \qquad -4}$

$\dfrac{16x}{16} = \dfrac{16}{16}$

$\dfrac{3y}{3} = \dfrac{6}{3}$

$\boxed{x = 1}$

$\boxed{y = 2}$

$\begin{matrix}(1, 2)\\ x \ \ y\end{matrix}$

$12(1) - 3(2) = 6$

$6 = 6 \checkmark$

$\therefore yes, (1, 2) \text{ is soln}$

7.3 Day 1 Homework

7.3 wkst (p.82) #1-14
(Show work on seperate sheet & only have final answers on wkst)

7.3 p.414 #8-15, 67-72

elimination   substitution