

**Warm Up***(do on own paper & label it Wed. Warm Up)*

Use the substitution method to solve the linear system:

$$1. \quad 2x - 5y = -13 \rightarrow 2(-3y - 1) - 5y = -13$$

$$x + 3y = -1$$

$$\quad \quad \quad -3y \quad -3y$$

$$\bullet \quad x = (-3y - 1)$$

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

$$x = -3 - 1$$

$$\underline{x = -4}$$

$$(-4, 1) \quad 2(-4) - 5(1) = -13$$

$$\quad \quad \quad -8 - 5 = -13$$

$$\quad \quad \quad -13 = -13 \quad \checkmark$$

$\therefore$  Yes,  $(-4, 1)$   
is soln

$$-6y - 2 - 5y = -13$$

$$-11y - 2 = -13$$

$$\quad \quad \quad +2 \quad +2$$

$$\underline{-11y = -11}$$

$$\underline{\underline{y = 1}}$$

**7.1-7.2 QUIZ**

Out of 20pts

A - 18

B - 16

C - 14

D - 12

# 7.3 Solving Linear Systems by Linear Combinations

**Goals:** • Solve a system of linear equations by linear combinations.

**EQ:** How are linear combinations different than the substitution method?

**The Unit Organizer**

NAME \_\_\_\_\_ Your Name  
DATE \_\_\_\_\_ Mo/Date/Year

④ BIGGER PICTURE Algebra 1.5

② LAST UNIT/Experience <b>Inequalities</b>	① CURRENT UNIT <b>Systems</b>	③ NEXT UNIT/Experience <b>Exponents</b>
⑧ Student Activities or Assignments  7.1 7.2 7.3 7.4 7.5 7.6	⑤ UNIT MAP  <p>1. Using addition 2. Using multiplication first 3. Arranging like terms first</p>	
⑦ UNIT SELF-TEST QUESTIONS  1. How do you solve a system by graphing? 2. How is the substitution method used to solve a system? 3. How do you use linear combinations to solve a system? 4. How can you represent and solve a real world situation with a system of equations? 5. How do you determine the number of solutions a system has? 6. How do you graph a system of linear inequalities and determine the solution area?	Solve Graph Represent Apply	⑨ UNIT RELATIONSHIPS

## Vocabulary

Linear combinations: (Elimination)

used to solve a system by combining the equations using addition

\* Add 2 eqns together

Opposite terms:

$$\frac{1}{4}x, -\frac{1}{4}x$$

$$3x, -3x$$

$$2y, -2y$$

### Example 1: Add the Equation

Solve the linear system.

$$\begin{array}{r} 7x + 2y = -6 \\ + 5x - 2y = 6 \\ \hline 12x = 0 \\ \frac{12x}{12} = \frac{0}{12} \end{array} \rightarrow \begin{array}{l} 7(0) + 2y = -6 \\ \frac{2y}{2} = \frac{-6}{2} \\ y = -3 \end{array}$$

$$\begin{array}{l} x = 0 \\ (0, -3) \end{array}$$

$$\begin{array}{l} 5(0) - 2(-3) = 6 \\ 6 = 6 \checkmark \end{array}$$

$\therefore$  Yes,  $(0, -3)$  is soln

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

$$\begin{array}{r}
 1) \quad 4x + y = -4 \\
 + \quad -4x + 2y = 16 \\
 \hline
 \quad \quad 3y = 12 \\
 \quad \quad \frac{3y}{3} = \frac{12}{3} \\
 \quad \quad \quad y = 4
 \end{array}
 \rightarrow
 \begin{array}{r}
 4x + 4 = -4 \quad (-2, 4) \\
 -4 \quad -4 \\
 \hline
 4x = -8 \\
 \frac{4x}{4} = \frac{-8}{4} \\
 x = -2
 \end{array}$$

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

$$\begin{array}{r}
 2) \quad 4x + 3y = 10 \\
 + \quad 12x - 3y = 6 \\
 \hline
 \quad 16x = 16 \\
 \quad \frac{16x}{16} = \frac{16}{16} \\
 \quad \quad x = 1
 \end{array}
 \rightarrow
 \begin{array}{r}
 12(1) - 3y = 6 \\
 12 - 3y = 6 \\
 -12 \quad -12 \\
 \hline
 -3y = -6 \\
 \frac{-3y}{-3} = \frac{-6}{-3} \\
 y = 2
 \end{array}$$

$(1, 2) \quad 4(1) + 3(2) = 10$   
 $4 + 6 = 10$   
 $10 = 10 \checkmark$

$\therefore$  Yes,  $(1, 2)$  is soln

## Summary

**EQ:** How are linear combinations different than the substitution method?

\* Need opposite terms in Linear Comb.

\* Also adding the two eqns

## 7.3 Homework

Solving Systems of Equations by Addition  
Method wkst (p.82)

\*Show work on separate sheet