

Warm Up

Solve by Substitution

$$d) \quad y = (x - 1) \longrightarrow y = 5 - 1$$

$$x - 5y = -15$$

$$x - 5(x - 1) = -15$$

$$x - 5x + 5 = -15$$

$$-4x + 5 = -15$$

$$\frac{-4x}{-4} = \frac{-20}{-4}$$

$$x = 5$$

\therefore Yes, $(5, 4)$ soln

$$y = 4$$

$$(5, 4)$$

x, y

$$5 - 5(4) = -15$$

$$5 - 20 = -15$$

$$-15 = -15 \checkmark$$

Homework Questions?

12)

$$\bullet \quad x = y + 5$$

$$2x + 3y = 0$$

$$2(y + 5) + 3y = 0$$

$$2y + 10 + 3y = 0$$

$$5y + 10 = 0$$

$$\frac{5y}{5} = \frac{-10}{5} \quad y = -2$$

$(0, 0)$

$$\begin{array}{l} 7) \\ x + y = 5 \rightarrow (y + 7) + y = 5 \\ \bullet x = y + 7 \quad y + 7 + y = 5 \end{array}$$

$$\begin{array}{l} 16) \\ x = y + 3 \\ -2x + y = -6 \end{array}$$

$$\begin{array}{l} (3, 0) \\ x \quad y \end{array}$$

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

7.2 Solving Linear Systems by Substitution

Goals: • Solve a linear system by substitution.

EQ: Which variable would be the easiest to solve for? $7x + y = -3$

$$4x - 2y = 10$$

The Unit Organizer NAME _____
DATE _____

④ BIGGER PICTURE Algebra 1.5

② LAST UNIT/Experience Inequalities	① CURRENT UNIT Systems	③ NEXT UNIT/Experience Exponents
⑧ Student Activities or Assignments 7.1 7.2 7.3 7.4 7.5 7.6	⑤ UNIT MAP <div style="text-align: center;"> </div>	⑨ UNIT RELATIONSHIPS Solve Graph Represent Apply
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?		

Example 1: Substitution Method – Solve for y First

Solve the linear system.

$$\begin{array}{l}
 1) \quad 2x - 3y = 3 \rightarrow 2x - 3(2x - 4) = 3 \\
 \quad -2x + y = -4 \quad \quad 2x - 6x + 12 = 3 \\
 \quad \quad +2x \quad +2x \quad \quad -4x + 12 = 3 \\
 \quad \bullet y = (2x - 4) \quad \quad -12 \quad -12 \\
 \quad y = 2\left(\frac{9}{4}\right) - 4 \quad \quad -4x = -9 \\
 \quad y = \frac{9}{2} - \frac{8}{2} \quad \quad \frac{-4}{-4} x = \frac{-9}{-4} \\
 \quad \bullet y = \frac{1}{2} \quad \quad x = \frac{9}{4} \\
 \quad \quad \quad \left(\frac{9}{4}, \frac{1}{2}\right) \\
 \quad 2\left(\frac{9}{4}\right) - 3\left(\frac{1}{2}\right) = 3 \\
 \quad \quad \quad 3 = 3 \checkmark \\
 \quad \bullet \therefore \text{Yes, } \left(\frac{9}{4}, \frac{1}{2}\right) \text{ soln}
 \end{array}$$

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

$$6x - y = 6$$

$$-6x \quad -6x$$

$$\frac{-y}{-1} = \frac{-6x + 6}{-1}$$

$$\bullet y = 6x - 6$$

Example 2: Substitution Method – Solve for x First

Solve the linear system.

3) $3x - 3y = 3$

$x + 3y = 9$

$-3y \quad -3y$

• $x = (-3y + 9)$

$x = -3(2) + 9$

$x = -6 + 9$

$x = 3$

$(3, 2)$
 $x \quad y$

$3(3) - 3(2) = 3$

$9 - 6 = 3$

$3 = 3 \checkmark$

yes! $(3, 2)$
sdn

$3(-3y + 9) - 3y = 3$

$-9y + 27 - 3y = 3$

$-12y + 27 = 3$

$-27 \quad -27$
 $-12y = -24$

$\frac{-12y}{-12} = \frac{-24}{-12}$
 $y = 2$

4) $5x - y = -8$

$x + y = 2$

$-y \quad -y$

• $x = -y + 2$

OR

$x + y = 2$

$-x \quad -x$

• $y = -x + 2$

Try It Name the variable that you would solve for first. Explain.

a) $x - 2y = 0$
 $x - 8y = -5$

\rightarrow $x - 2y = 0$
 $\quad \quad \quad + 2y \quad + 2y$

• $x = 2y$

b) $4x + 2y = 10$
 $7x - y = 12$

$-7x \quad -7x$

$\frac{-y}{-1} = \frac{-7x + 12}{-1}$ • $y = 7x - 12$

SUMMARY

EQ: Which variable would be the easiest to solve for? $7x + y = -3$

$$4x - 2y = 10$$

1)

- 1) • Eqn w/ variable by itself
- 2) Plug in () to working eqn
- 3) Solve for variable
- 4) Plug value into • Eqn
- 5) Solve for variable
- 6) (x, y) ✓ in working eqn

7.2 Homework

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