

Solving Linear Systems by Substitution

Chapter 7 Section 2

7.2) Solve Using Substitution

◦ Steps:

- 1. Choose a variable to solve for.
- 2. Substitute that equation into the 2nd equation for the variable you solve for.
- 3. Solve for the variable remaining.
- 4. Plug that number in to either equation to get the 2nd variable.

Examples:

o 1.
$$\begin{aligned} 3x + 2y &= 7 \\ x - 2y &= -3 \end{aligned}$$

$$\begin{array}{r} x - 2y = -3 \\ + 2y \quad + 2y \\ \hline \end{array}$$

$$x = 2y - 3$$

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

$$x = 4 - 3 = 1$$

$$(1, 2)$$

$$3(2y - 3) + 2y = 7$$

$$6y - 9 + 2y = 7$$

$$8y - 9 = 7$$

$$8y = 16$$

$$y = 2$$

Examples:

o 2.
$$\begin{array}{l} x + 2y = 7 \\ -x + 6y = -3 \end{array}$$

$$\begin{array}{r} x + 2y = 7 \\ -2y \quad -2y \\ \hline \end{array}$$

$$x = -2y + 7$$

$$x = -2\left(\frac{1}{2}\right) + 7$$

$$x = -1 + 7 = 6$$

$$-(-2y + 7) + 6y = -3$$

$$2y - 7 + 6y = -3$$

$$\begin{array}{r} 8y - 7 = -3 \\ +7 \quad +7 \\ \hline \end{array}$$

$$\begin{array}{r} 8y = 4 \\ \frac{8}{8} \quad \frac{4}{8} \\ \hline \end{array}$$

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

$$(6, \frac{1}{2})$$

Examples

$$\begin{array}{l} 2x + y = 3 \\ \text{or } 3. \quad 3x + y = 0 \end{array}$$

$$\begin{array}{r} \cancel{2x} + y = 3 \\ - \cancel{2x} \quad - 2x \\ \hline y = -2x + 3 \end{array}$$

$$\begin{aligned} y &= -2(-3) + 3 \\ y &= 6 + 3 = 9 \end{aligned}$$

$$\begin{aligned} 3x + (-2x + 3) &= 0 \\ 3x - 2x + 3 &= 0 \end{aligned}$$

$$\begin{array}{r} x + 3 = 0 \\ -3 \quad -3 \\ \hline \end{array}$$

$$x = -3$$

$$(-3, 9)$$

Examples:

o 4.

$$\begin{array}{l} 3x - y = 5 \\ 4x + 2y = 10 \end{array}$$

$$\begin{array}{rcl} 3x - y & = & 5 \\ -3x & & -3x \\ \hline -y & = & -3x + 5 \end{array}$$

$$y = 3x - 5$$

$$\begin{array}{l} y = 3(2) - 5 \\ y = 6 - 5 = 1 \end{array}$$

$$4x + 2(3x - 5) = 10$$

$$4x + 6x - 10 = 10$$

$$10x - 10 = 10$$

$$\frac{10x}{10} = \frac{20}{10}$$

$$x = 2$$

$$(2, 1)$$

Examples:

o 5. $y = 4x$
 $-2x + y = -4$

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

$$\frac{2x}{2} = \frac{-4}{2}$$

$$x = -2$$

$$(-2, -8)$$

$$y = 4x$$

$$y = 4(-2)$$

$$y = -8$$

Class Work

o Page 408 # 18-26 even

Homework

- o Page 408 # 6,7,9-11
- o Pg 410# 54-57, 60, 61, 65, 68