Name Key
Mrs. Roumbos

Date _____
Math 8R

Solving Systems of Equations Day II: Using Substitution

I. **Steps:**

1. Replace what x or y are equal to into the other equation in place of the appropriate letter.
2. Solve the remaining equation.
3. Solve for the missing variable.
4. Do two checks.

II. **Practice:** Solve for the missing variables and check.

1. $3y - 2x = 11$
   $y = 9 - 2x$

$3y - 2x = 11$
$3(9-2x) - 2x = 11$
$27 - 6x - 2x = 11$
$27 - 8x = 11$
$-27 \quad -27$
$-8x = -16$
$-8 \quad -8$
$x = 2$

$y = 9 - 2x$
$y = 9 - 2(2)$
$y = 9 - 4$
$y = 5$

$(2,5)$

Check #1
$(2,5)$
$x \; y$

$3y - 2x = 11$
$3(5) - 2(2) = 11$
$15 - 4 = 11$
$11 = 11$ ✓

Check #2
$(2,5)$
$x \; y$

$y = 9 - 2x$
$5 = 9 - 2(2)$
$5 = 9 - 4$
$5 = 5$ ✓

2. $y = 5x - 7$
   $3x - 4y = -6$

$3x - 4y = -6$
$3x - 4(5x - 7) = -6$
$3x - 20x + 28 = -6$
$-17x + 28 = -6$
$-28 \quad -28$
$-17x = -34$
$-17 \quad -17$
$x = 2$

$y = 5x - 7$
$y = 5(2) - 7$
$y = 10 - 7$
$y = 3$

$(2,3)$

Check #1
$(2,3)$
$x \; y$

$y = 5x - 7$
$3 = 5(2) - 7$
$3 = 10 - 7$
$3 = 3$ ✓

Check #2
$(2,3)$
$x \; y$

$3x - 4y = -6$
$3(2) - 4(3) = -6$
$6 - 12 = -6$
$-6 = -6$ ✓

3. $3y + 2x = 16$
$x = 2y + 1$

$3y + 2x = 16$
$3y + 2(2y + 1) = 16$
$3y + 4y + 2 = 16$
$7y + 2 = 16$
$-2 \quad -2$
$\frac{7y}{7} = \frac{14}{7}$
$y = 2$

$x = 2y + 1$
$x = 2(2) + 1$
$x = 4 + 1$
$x = 5$

$(5, 2)$

Check #1
$(5, 2)$
$x \quad y$
$3y + 2x = 16$
$3(2) + 2(5) = 16$
$6 + 10 = 16$
$16 = 16$ ✓

Check #2
$(5, 2)$
$x \quad y$
$x = 2y + 1$
$5 = 2(2) + 1$
$5 = 4 + 1$
$5 = 5$ ✓

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4. $2y - x = 10$
$x = -y + 2$

$2y - x = 10$
$2y - 1(-y + 2) = 10$
$2y + y - 2 = 10$
$3y - 2 = 10$
$+2 \quad +2$
$\frac{3y}{3} = \frac{12}{3}$
$y = 4$

$x = -y + 2$
$x = -1(4) + 2$
$x = -4 + 2$
$x = -2$

$(-2, 4)$

Check #1
$(-2, 4)$
$x \quad y$
$2y - x = 10$
$2(4) - (-2) = 10$
$8 + 2 = 10$
$10 = 10$ ✓

Check #2
$(-2, 4)$
$x \quad y$
$x = -y + 2$
$-2 = -(4) + 2$
$-2 = -4 + 2$
$-2 = -2$ ✓