

Solving Systems of Equations by Substitution

Solve each system by substitution.

1) $y = 6x - 11$
 $-2x - 3y = -7$

$$-2x - 3(6x - 11) = -7$$

$$-2x - 18x + 33 = -7$$

$$-20x + 33 = -7$$

$$-20x = -40$$

$$y = 6(2) - 11$$

$$y = 12 - 11$$

$$y = 1$$

(2, 1)

2) $2x - 3y = -1$
 $y = x - 1$

$$2x - 3(x - 1) = -1$$

$$2x - 3x + 3 = -1$$

$$-x + 3 = -1$$

$$-x = -4$$

$$x = 4$$

$$y = 4 - 1$$

$$y = 3$$

(4, 3)

3) $y = -3x + 5$
 $5x - 4y = -3$

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

$$5x + 12x - 20 = -3$$

$$17x - 20 = -3$$

$$17x = 17$$

$$x = 1$$

$$y = -3(1) + 5$$

$$y = -3 + 5$$

$$y = 2$$

(1, 2)

4) $-3x - 3y = 3$
 $y = -5x - 17$

$$-3x - 3(-5x - 17) = 3$$

$$-3x + 15x + 51 = 3$$

$$12x + 51 = 3$$

$$12x = -48$$

$$x = -4$$

$$-3(-4) - 3y = 3$$

$$12 - 3y = 3$$

$$-12 - 3y = -9$$

$$-3y = -9$$

$$y = 3$$

(-4, 3)

5) $y = -2$
 $4x - 3y = 18$

$$4x - 3(-2) = 18$$

$$4x + 6 = 18$$

$$4x = 12$$

$$x = 3$$

(3, -2)

6) $y = 5x - 7$
 $-3x - 2y = -12$

$$-3x - 2(5x - 7) = -12$$

$$-3x - 10x + 14 = -12$$

$$-13x + 14 = -12$$

$$-13x = -26$$

$$x = 2$$

$$y = 5(2) - 7$$

$$y = 10 - 7$$

$$y = 3$$

(2, 3)

7) $-4x + y = 6$
 $-5x - y = 21$

$$-4x + y = 6$$

$$+4x \quad +4x$$

$$y = 6 + 4x$$

$$-5x - (6 + 4x) = 21$$

$$-5x - 6 - 4x = 21$$

$$-9x - 6 = 21$$

$$-9x = 27$$

$$x = -3$$

$$y = 6 + 4(-3)$$

$$y = 6 - 12$$

$$y = -6$$

(-3, -6)

8) $-7x - 2y = -13$
 $x - 2y = 11$

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

$$x = 11 + 2y$$

$$-7(11 + 2y) - 2y = -13$$

$$-77 - 14y - 2y = -13$$

$$-77 - 16y = -13$$

$$-16y = 64$$

$$y = -4$$

$$x = 11 + 2(-4)$$

$$x = 11 - 8$$

$$x = 3$$

(3, -4)

9) $-5x + y = -2$
 $-3x + 6y = -12$

$$-5x + y = -2$$

$$+5x \quad +5x$$

$$y = -2 + 5x$$

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

$$y = -2 + 0$$

$$y = -2$$

(0, -2)

10) $-5x + y = -3$
 $3x - 8y = 24$

$$-5x + y = -3$$

$$+5x \quad +5x$$

$$y = -3 + 5x$$

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

$$y = -3 + 0$$

$$y = -3$$

(0, -3)

$$-3x + 6(-2 + 5x) = -12$$

$$-3x - 12 + 30x = -12$$

$$-12 + 27x = -12$$

$$27x = 0 \quad x = 0$$

$$3x - 8(-3 + 5x) = 24$$

$$3x + 24 - 40x = 24$$

$$-37x + 24 = 24$$

$$-37x = 0 \quad x = 0$$