

Solving Systems of Equations by Substitution

Solve each system by substitution.

1)  $y = 6x - 11$

$-2x - 3y = -7$

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

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

$-20x + 33 = -7$

$-33 - 33$

$-20x = -40$

$x = 2$

$x = 2$

$y = 6(2) - 11$

$y = 12 - 11$

$y = 1$

$(2, 1)$

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

$y = x - 1$

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

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

$-x + 3 = -1$

$-3 - 3$

$-x = -4$

$x = 4$

$y = 4 - 1$

$y = 3$

$(4, 3)$

3)  $y = -3x + 5$

$5x - 4y = -3$

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

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

$17x - 20 = -3$

$+20 + 20$

$17x = 17$

$x = 1$

$4x - 3y = 18$

$x = 1$

$y = -3(1) + 5$

$y = -3 + 5$

$y = 2$

$(1, 2)$

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

$y = -5x - 17$

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

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

$12x + 51 = 3$

$12x = -48$

$x = -4$

$y = -5(-4) - 17$

$y = 20 - 17$

6)  $y = 5x - 7$

$-3x - 2y = -12$

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

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

$-13x + 14 = -12$

$-13x = -26$

$x = 2$

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

$x - 2y = 11$

$x = 2y + 11$

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

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

$-16y - 77 = -13$

$-16y = 64$

$y = -4$

$x = 2(-4) + 11$

$x = -8 + 11$

$x = 3$

$(3, -4)$

$(0, -3)$

7)  $-4x + y = 6$

$-5x - y = 21$

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

$4x + 6 = 18$

$4x = 12$

$x = 3$

$-4(3) + y = 6$

$-12 + y = 6$

$y = 18$

$(3, 18)$

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

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

$-9x - 6 = 21$

$+6 + 6$

$-9x = 27$

$x = -3$

$y = 4(-3) + 6$

$y = -12 + 6$

$y = -6$

$(-3, -6)$

$(0, -2)$

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

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

$27x = 0$

$x = 0$

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

$3x - 8y = 24$

$y = 5x - 3$

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

$3x - 40x + 24 = 24$

$-37x = 0$

$x = 0$