5.3 Systems of Equations

PRACTICE

Directions: Solve each system of equations by SUBSTITUTION or ELIMINATION. You can check with a graphing calculator but not solve it. SHOW WORK.

1) $4x + 4y = 4$
$x - 9 = y$

$4x + 4(x-9) = 4$
$4x + 4x - 36 = 4$
$8x = 40$
$x = 5$

$x - 9 = y$
$5 - 9 = y$
$-4 = y$

$(5, -4)$

2) $6x - 14y = -8$
$(-3x + 7y = 4)\,2$

$6x - 14y = -8$
$-6x + 14y = 8$
$0 = 0$

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3) $(7x + 6y = -3)\,8$
$(-8x - 9y = 12)\,7$

$56x + 48y = -24$
$-56x - 63y = 84$
$-15y = 60$
$y = -4$

$7x + 6(-4) = -3$
$7x - 24 = -3$
$7x = 21$
$x = 3$

$(3, -4)$

4) $-3x + 4 = y$
$6x + 2y = 5$

$6x + 2(-3x + 4) = 5$
$6x - 6x + 8 = 5$
$8 = 5$

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5) $(-5x - 7y = 27)\,8$
$(8x + 6y = -12)\,5$

$-40x - 56y = 216$
$40x + 30y = -60$
$-26y = 156$
$y = -6$

$-5x - 7(-6) = 27$
$-5x + 42 = 27$
$-5x = -15$
$x = 3$

$(3, -6)$

6) $3y + 27 = x$
$-3x + 2y = -11$

$-3(3y + 27) + 2y = -11$
$-9y - 81 + 2y = -11$
$-7y - 81 = -11$
$-7y = 70$
$y = -10$

$3(-10) + 27 = x$
$-30 + 27 = x$
$-3 = x$

$(-3, -10)$

7) $10x + y = 1$
$y = x^2 + 4x + 50$

$10x + x^2 + 4x + 50 = 1$
$x^2 + 14x + 49 = 0$
$(x+7)(x+7) = 0$
$x = -7$

$10(-7) + y = 1$
$-70 + y = 1$
$y = 71$

$(-7, 71)$

8) $y - x = 1$
$-2x^2 - 10x - 4 = y$

$-2x^2 - 10x - 4 - x = 1$
$-2x^2 - 11x - 5 = 0$
$-(2x^2 + 11x + 5) = 0$
$-(2x^2 + 10x + x + 5) = 0$
$-[2x(x+5) + 1(x+5)] = 0$
$-(2x+1)(x+5) = 0$
$x = -1/2 \quad x = -5$

$y - (-1/2) = 1$
$y + 1/2 = 1$
$y = 1/2$

$y - (-5) = 1$
$y + 5 = 1$
$y = -4$

$(-1/2, 1/2)\ (-5, -4)$

9) $y = x^2 + 3x - 9$

$2x - y = 3$

$2x - (x^2 + 3x - 9) = 3$

$2x - x^2 - 3x + 9 = 3$

$-3 \quad -3$

$-x^2 - x + 6 = 0$

$-(x^2 + x - 6) = 0$

$-(x+3)(x-2) = 0$

$x = -3 \quad x = 2$

$2(-3) - y = 3$

$-6 - y = 3$

$-y = 9$

$y = -9$

$2(2) - y = 3$

$4 - y = 3$

$-y = -1$

$y = 1$

$(-3, -9)(2, 1)$

10) $x^2 - 3x = y$

$-3x = y - 4$

$+4 \quad +4$

$-3x + 4 = y$

$x^2 - 3x = -3x + 4$

$x^2 - 4 = 0$

$(x-2)(x+2) = 0$

$x = 2 \quad x = -2$

$-3(2) + 4 = y$

$-6 + 4 = y$

$-2 = y$

$-3(-2) + 4 = y$

$6 + 4 = y$

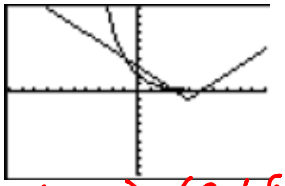
$10 = y$

$(2, -2) \quad (-2, 10)$

Directions: Use a graphing calculator to sketch the graph of the system and then solve it. Round to NEAREST HUNDREDTH.

11) $y = 2\left(\frac{1}{2}\right)^x$

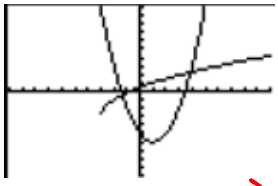
$y = |x - 4| - 1$



$(-1, 4) \quad (2.69, 0.31)$

12) $y = 2\sqrt{x+3} - 3$

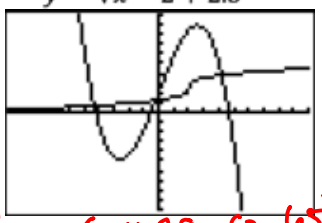
$y = (x-1)^2 - 6$



$(-1.36, -0.44) \quad (3.87, 2.29)$

13) $y = -0.2x^3 + 4x + 2$

$y = \sqrt[3]{x-2} + 2.5$



$(-4.29, 0.65)$

$(-0.20, 1.20)$

$(4.23, 3.81)$