Algebra 1 Yearlong Worksheet 17C

Solve the following systems of equations using the ***substitution*** method.

1) $y = -2x + 5$
$x - y = -8$

$y = -2(-1) + 5$

$x - 1(-2x + 5) = -8$

$x + 2x + -5 = -8$

$3x + -5 = -8$

$3x = -3$

$x = -1$

$y = 2 + 5$

$y = 7$

$(-1, 7)$

2) $x + 2y = -6$
$3x - 5y = 26$

$3x = 5y + 26 \rightarrow x = \frac{5}{3}y + \frac{26}{3}$

$(\frac{5}{3}y + \frac{26}{3}) + 2y = -6$

$\frac{5}{3}y + \frac{26}{3} + 2y = -6$

$\cdot 3 \quad \cdot 3 \quad \cdot 3 \quad \cdot 3$

$5y + 26 + 6y = -18$

$11y + 26 = -18$

$11y = -44$

$y = -4$

$x = \frac{5}{3}(-4) + \frac{26}{3}$

$x = \frac{-20}{3} + \frac{26}{3}$

$x = 6/3$

$x = 2$

$(2, -4)$

3) $y = 3 + 2x$
$5x - y = 0$

$5x - (3+2x) = 0$

$5x - 3 - 2x = 0$

$3x - 3 = 0$

$3x = 3$

$x = 1$

$y = 3 + 2(1)$

$y = 3 + 2$

$y = 5$

$(1, 5)$

4) $x - y = 7$
$x + 3y = 15$

$x = y + 7$

$(y+7) + 3y = 15$

$4y + 7 = 15$

$4y = 8$

$y = 2$

$x = (2) + 7$

$x = 9$

$(9, 2)$

5) $2x + 3y = 7$
$2x + 4y = 8$ → $2x = -4y + 8$

$(-4y + 8) + 3y = 7$

$-1y + 8 = 7$

$-1y = -1$

$y = 1$

$2x = -4(1) + 8$

$2x = -4 + 8$

$2x = 4$

$x = 2$

$(2, 1)$

6) $x + y = -3$ → $x = -y + -3$
$-5x - 3y = 1$

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

$5y + 15 - 3y = 1$

$2y + 15 = 1$

$2y = -14$

$y = -7$

$x = -(-7) + -3$

$x = 7 + -3$

$x = 4$

$(4, -7)$

7) $2x - y = -1$
$3x + 2y = -5$

$-y = -2x + -1$
$\cdot -1 \quad \cdot -1 \quad \cdot -1$
$y = 2x + 1$

$3x + 2(2x+1) = -5$

$3x + 4x + 2 = -5$

$7x + 2 = -5$

$7x = -7$

$x = -1$

$y = 2(-1) + 1$

$y = -2 + 1$

$y = -1$

$(-1, -1)$

8) $2x + 3y = 12$
$5x - 2y = 11$

$5x = 2y + 11$

$x = \frac{2}{5}y + \frac{11}{5}$

$2\left(\frac{2}{5}y + \frac{11}{5}\right) + 3y = 12$

$\frac{4}{5}y + \frac{22}{5} + 3y = 12$

$\cdot 5 \quad \cdot 5 \quad \cdot 5 \quad \cdot 5$

$4y + 22 + 15y = 60$

$19y + 22 = 60$

$19y = 38$

$y = 2$

$x = \frac{2}{5}(2) + \frac{11}{5}$

$x = \frac{4}{5} + \frac{11}{5}$

$x = \frac{15}{5}$

$x = 3$

$(3, 2)$

9) $x + y = 1$
$6x + 12y = 13$

$y = -x + 1$

$6x + 12(-x+1) = 13$

$6x + -12x + 12 = 13$

$-6x + 12 = 13$

$-6x = 1$

$x = \frac{-1}{6}$

$y = -\left(\frac{-1}{6}\right) + 1$

$y = \frac{1}{6} + 1$

$y = \frac{1}{6} + \frac{6}{6}$

$y = \frac{7}{6}$

$\left(-\frac{1}{6}, \frac{7}{6}\right)$

10) $3x - 5y = 13$
$-8x - 4y = 0$

$3x = 13 + 5y$

$x = \frac{13}{3} + \frac{5}{3}y$

$-8\left(\frac{13}{3} + \frac{5}{3}y\right) - 4y = 0$

$\frac{-104}{3} + \frac{-40}{3}y - 4y = 0$

$\cdot 3 \quad \cdot 3 \quad \cdot 3 \quad \cdot 3$

$-104 + -40y + -12y = 0$

$-104 + -52y = 0$

$-52y = 104$

$y = -2$

$x = \frac{13}{3} + \frac{5}{3}(-2)$

$x = \frac{13}{3} + \frac{-10}{3}$

$x = \frac{3}{3}$

$x = 1$

$(1, -2)$