

Algebra I

9-2

Solving Systems: The Substitution Method

Solve by the substitution method. (pg 419)

$$\begin{aligned} 1) \quad y &= 6x & x + y &= 28 \\ y &= 6(4) & x + 6x &= 28 \\ y &= 24 & 7x &= 28 \\ & & x &= 4 \end{aligned}$$

$$\{(4, 24)\}$$

$$7) \quad 3x + 1 = y$$

$$2x + 3y = 25$$

$$\begin{aligned} 2x + 3(3x + 1) &= 25 \\ 2x + 9x + 3 &= 25 \\ 11x + 3 &= 25 \\ 11x + 3 - 3 &= 25 - 3 \\ 11x &= 22 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} 3(2) + 1 &= y \\ 6 + 1 &= y \\ 7 &= y \end{aligned}$$

$$\{(2, 7)\}$$

$$\begin{aligned} 13) \quad 2r + 3s &= 0 \\ r + 5 &= 6s \end{aligned}$$

$$\begin{aligned} r + 5 - 5 &= 6s - 5 \\ r &= 6s - 5 \\ 2(6s - 5) + 3s &= 0 \\ 12s - 10 + 3s &= 0 \\ 15s - 10 &= 0 \\ 15s - 10 + 10 &= 0 + 10 \\ 15s &= 10 \\ s &= \frac{2}{3} \end{aligned}$$

$$\begin{aligned} r &= 6\left(\frac{2}{3}\right) - 5 \\ r &= 4 - 5 \\ r &= -1 \end{aligned}$$

$$\left\{(-1, \frac{2}{3})\right\}$$

$$17) \quad c - d = 8$$

$$[5d + 20] - d = 8$$

$$4d + 20 = 8$$

$$4d + 20 - 20 = 8 - 20$$

$$\frac{4d}{4} = \frac{-12}{4}$$

$$d = -3$$

$$\left(\frac{c}{5} = d + 4\right) 5$$

$$c = 5d + 20$$

$$c = 5(-3) + 20$$

$$c = -15 + 20$$

$$c = 5$$

$$\{(5, -3)\}$$

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