

pg 392: 8, 10, 12-15, 16, 20, 23,
24, 25

⑧ Solution

⑩ Solution

⑫ Not a Solution

⑬ (4, 5)

⑭ (-2, -2)

⑮ (3, 0)

⑯ (1, 2)

⑰ (16, -16)

⑱ (1, 4)

⑲ (0, 9)

⑳ 125,000 Miles

$$\textcircled{12} \quad -2x + y = 11 \quad -x - 9y = -15$$

$$(6, 1) \quad -2(6) + (1) = 11 \quad -(6) - 9(1) = -15$$

$$-12 + 1 = 11$$

$$-11 \neq 11$$

Not a Solution

7.2 Solving Linear Systems w/ Substitution

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Which Equation do I want to solve for what variable?

$$\begin{array}{l} * \quad -x + y = 1 \\ \quad \quad 2x + y = -2 \end{array} \rightarrow \begin{array}{l} 2x + (x+1) = -2 \\ 2x + x + 1 = -2 \\ 3x + 1 = -2 \\ \underline{-1 \quad -1} \\ 3x = -3 \\ \underline{\quad 3} \\ x = -1 \end{array}$$
$$\begin{array}{r} -x + y = 1 \\ +x \quad +x \\ \hline y = (x+1) \end{array}$$
$$\begin{array}{l} y = (-1) + 1 \\ \underline{\underline{y = 0}} \end{array}$$

$x = -1$

So... The Solution is: $(-1, 0)$

$$\begin{array}{l} -x + y = 1 \\ -(-1) + (0) \stackrel{?}{=} 1 \\ 1 + 0 \stackrel{?}{=} 1 \\ 1 = 1 \quad \checkmark \end{array} \quad \begin{array}{l} 2x + y = -2 \\ 2(-1) + (0) \stackrel{?}{=} -2 \\ -2 + 0 \stackrel{?}{=} -2 \\ -2 = -2 \quad \checkmark \end{array}$$

$$\begin{array}{l}
 * \quad \begin{array}{l} 2x + 2y = 3 \\ x - 4y = -1 \end{array} \rightarrow \begin{array}{l} 2(4y-1) + 2y = 3 \\ 8y - 2 + 2y = 3 \\ 10y - 2 = 3 \\ \quad +2 \quad +2 \\ \hline 10y = 5 \\ \frac{10y}{10} = \frac{5}{10} \\ \boxed{y = \frac{1}{2}} \end{array} \\
 \\
 \begin{array}{l} x - 4y = -1 \\ \quad +4y \quad +4y \\ \hline x = (4y - 1) \end{array} \\
 \\
 \begin{array}{l} x = 4\left(\frac{1}{2}\right) - 1 \\ x = 2 - 1 \\ \underline{\underline{x = 1}} \end{array}
 \end{array}$$

So... The Solution is: $\left(1, \frac{1}{2}\right)$

$$\begin{array}{ll}
 2x + 2y = 3 & x - 4y = -1 \\
 2(1) + 2\left(\frac{1}{2}\right) \stackrel{?}{=} 3 & (1) - 4\left(\frac{1}{2}\right) \stackrel{?}{=} -1 \\
 2 + 1 \stackrel{?}{=} 3 & 1 - 2 \stackrel{?}{=} -1 \\
 3 = 3 \checkmark & -1 = -1 \checkmark
 \end{array}$$

$$\begin{array}{l}
 * \quad \begin{array}{l} \underline{x + 3y = -11} \\ \underline{2x - 5y = 33} \end{array} \rightarrow \begin{array}{l} 2(-3y - 11) - 5y = 33 \\ -6y - 22 - 5y = 33 \\ -11y - 22 = 33 \\ - 22 + 22 \\ \hline -11y = 55 \\ \div -11 \\ \hline y = -5 \end{array} \\
 \begin{array}{l} x + 3y = -11 \\ \underline{-3y \quad -3y} \\ x = -3y - 11 \end{array} \\
 \begin{array}{l} x = -3(-5) - 11 \\ x = 15 - 11 \\ \boxed{x = 4} \end{array} \\
 \boxed{y = -5}
 \end{array}$$

SO... the solution is: (4, -5)

$$\begin{array}{l}
 x + 3y = -11 \\
 (4) + 3(-5) \stackrel{?}{=} -11 \\
 4 + -15 \stackrel{?}{=} -11 \\
 -11 = -11 \checkmark
 \end{array}
 \quad
 \begin{array}{l}
 2x - 5y = 33 \\
 2(4) - 5(-5) \stackrel{?}{=} 33 \\
 8 + 25 \stackrel{?}{=} 33 \\
 33 = 33 \checkmark
 \end{array}$$

The Process

Step 1: Solve 1 equ. for an easy variable

Step 2: Sub. into the other equ.

Step 3: Solve for the Var. from Step 2.

Step 4: Sub. into the Step 1 equ.

Step 5: Solve for the other Var.

Step 6: Mental Check!

O.T.L.

① p 399: 10, $13-16(a)$, $20-2>(a)$

