

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)

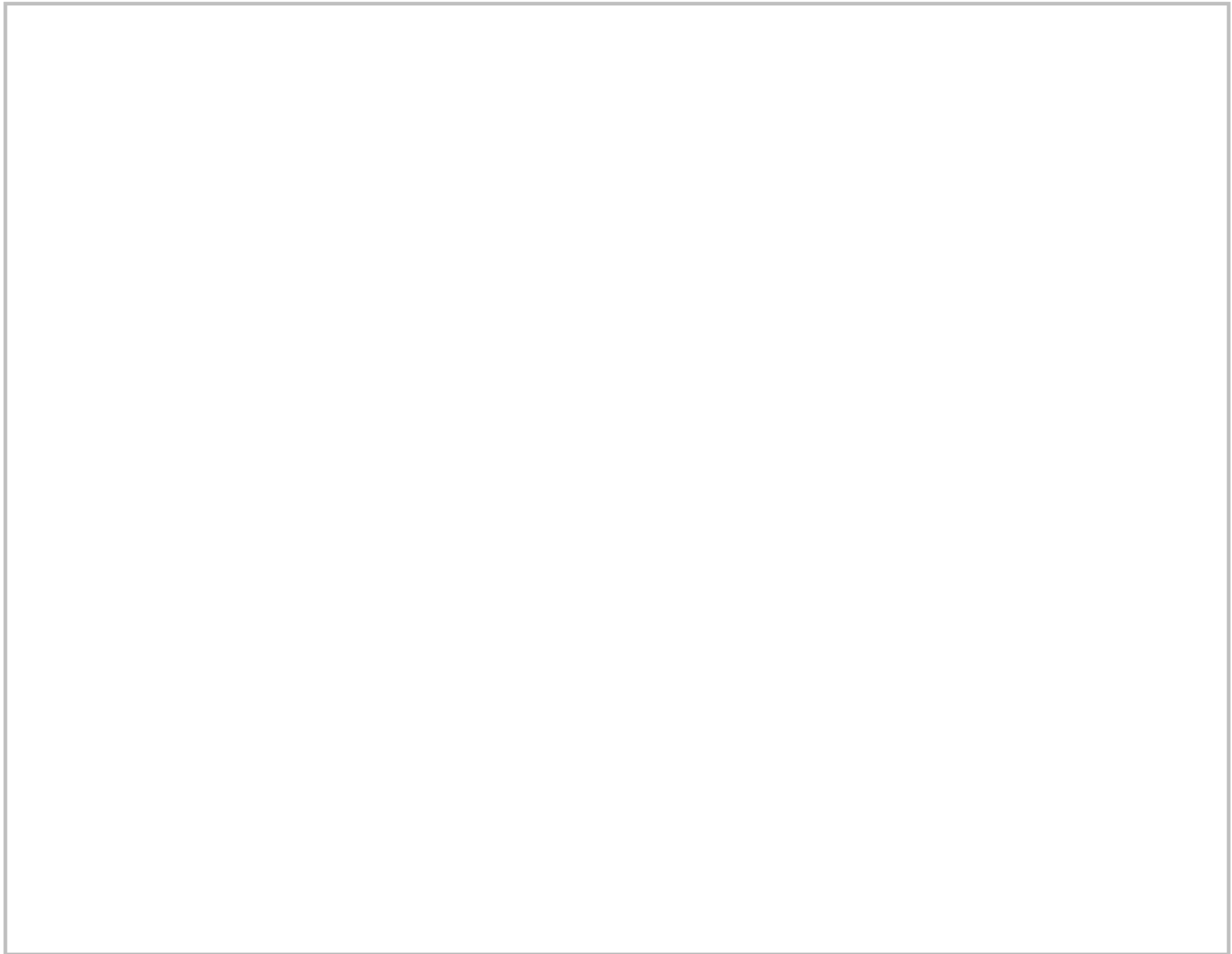
⑯ (1, 2)

⑰ (16, -16)

⑲ (1, 4)

⑳ (0, 9)

㉑ 125,000 Miles



## 7.2 Solving Linear Systems w/ Substitution

Jan. 18, 2007

Which Equation do I want to solve for what variable?

$$\begin{aligned} * \quad & -x + y = 1 \\ & 2x + y = -2 \end{aligned}$$

$$\begin{aligned} & \rightarrow 2x + (x+1) = -2 \\ & 2x + x + 1 = -2 \end{aligned}$$

$$\begin{aligned} -x + y &= 1 \\ +x & \quad +x \\ \hline y &= (x+1) \end{aligned}$$

$$\begin{aligned} 2x + x + 1 &= -2 \\ 3x + 1 &= -2 \\ -1 & \quad -1 \\ \hline 3x &= -3 \end{aligned}$$

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

$$x = -1$$

$$\begin{aligned} y &= -1 + 1 \\ y &= 0 \end{aligned}$$

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

Check:

$$\begin{aligned} -x + y &= 1 \\ -(-1) + (0) &\stackrel{?}{=} 1 \\ 1 + 0 &\stackrel{?}{=} 1 \\ 1 &= 1 \checkmark \end{aligned}$$

$$\begin{aligned} 2x + y &= -2 \\ 2(-1) + (0) &\stackrel{?}{=} -2 \\ -2 + 0 &\stackrel{?}{=} -2 \\ -2 &= -2 \checkmark \end{aligned}$$

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

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

Check:

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

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

So... the solution is:  $(4, -5)$

## 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), 20-22(a)

