



# Algebra 2

Topic 3 // Substitution A

N: Key

D:

P: 1 2 3 4 5 6

Standards: 2.0

Holt: 3-2 Solving Linear Systems p. 190

1.)  $y = x + 3$   
 $y = 2x + 4$

$$\begin{array}{r} x+3 = 2x+4 \\ -x \quad -4 \quad -x \quad -4 \\ \hline -1 = x \end{array}$$

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

$$y = 2$$

**(-1, 2)**

2.)  $y = 2x + 10$   
 $y = -2x - 6$

$$\begin{array}{r} 2x+10 = -2x-6 \\ +2x \quad -10 \quad +2x \quad -10 \\ \hline 4x = -16 \\ \frac{4x}{4} = \frac{-16}{4} \\ x = -4 \end{array}$$

$$y = 2(-4) + 10$$

$$y = -8 + 10$$

$$y = 2$$

**(-4, 2)**

3.)  $y = 5x - 10$   
 $y = 3x + 8$

$$\begin{array}{r} 5x-10 = 3x+8 \\ -3x \quad +10 \quad -3x \quad +10 \\ \hline 2x = 18 \\ \frac{2x}{2} = \frac{18}{2} \\ x = 9 \end{array}$$

$$y = 5(9) - 10$$

$$y = 45 - 10$$

$$y = 35$$

**(9, 35)**

4.)  $y = x + 5$   
 $4x + y = 20$

$$\begin{array}{r} 4x + (x+5) = 20 \\ 4x + x + 5 = 20 \\ 5x + 5 = 20 \\ -5 \quad -5 \\ \hline 5x = 15 \\ \frac{5x}{5} = \frac{15}{5} \rightarrow x = 3 \end{array}$$

$$y = (3) + 5$$

$$y = 8$$

**(3, 8)**

5.)  $x = y - 8$   
 $-x - y = 0$

$$\begin{array}{r} -(y-8) - y = 0 \\ -y + 8 - y = 0 \\ -2y + 8 = 0 \\ -8 \quad -8 \\ \hline -2y = -8 \\ \frac{-2y}{-2} = \frac{-8}{-2} \rightarrow y = 4 \end{array}$$

$$x = (4) - 8$$

$$x = -4$$

**(-4, 4)**

6.)  $x = 2y + 10$   
 $\frac{1}{2}x - 2y = 4$

$$\begin{array}{r} \frac{1}{2}(2y+10) - 2y = 4 \\ y + 5 - 2y = 4 \\ -y + 5 = 4 \\ -5 \quad -5 \\ \hline -y = -1 \\ (-1) - y = -1(-1) \rightarrow y = 1 \end{array}$$

$$x = 2(1) + 10$$

$$x = 2 + 10$$

$$x = 12$$

**(12, 1)**

7.)  $y = x + 4$   
 $3x - 2y = -7$

$$\begin{array}{r} 3x - 2(x+4) = -7 \\ 3x - 2x - 8 = -7 \\ x - 8 = -7 \\ +8 \quad +8 \\ \hline x = 1 \end{array}$$

$$y = (1) + 4$$

$$y = 5$$

**(1, 5)**

8.)  $x = -2y - 1$   
 $4x - 4y = 20$

$$\begin{array}{r} 4(-2y-1) - 4y = 20 \\ -8y - 4 - 4y = 20 \\ -12y - 4 = 20 \\ +4 \quad +4 \\ \hline -12y = 24 \\ \frac{-12y}{-12} = \frac{24}{-12} \rightarrow y = -2 \end{array}$$

$$x = -2(-2) - 1$$

$$x = 4 - 1$$

$$x = 3$$

**(3, -2)**

9.)  $y = -3x + 4$   
 $x = 2y + 6$

$$\begin{array}{r} x = 2(-3x+4) + 6 \\ x = -6x + 8 + 6 \\ x = -6x + 14 \\ +6x \quad +6x \\ \hline 7x = 14 \\ \frac{7x}{7} = \frac{14}{7} \rightarrow x = 2 \end{array}$$

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

$$y = -6 + 4$$

$$y = -2$$

**(2, -2)**

10.)  $x = 7 - 2y$   
 $2x + y = 5$

$$\begin{array}{r} 2(7-2y) + y = 5 \\ 14 - 4y + y = 5 \\ 14 - 3y = 5 \\ -14 \quad -14 \\ \hline -3y = -9 \\ \frac{-3y}{-3} = \frac{-9}{-3} \rightarrow y = 3 \end{array}$$

$$x = 7 - 2(3)$$

$$x = 7 - 6$$

$$x = 1$$

**(1, 3)**