

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_ HOUR: \_\_\_\_\_

Section 5.2: Solving Systems of linear Equations by Substitution (Reference Practice)

Directions: For each of the following problems a reference example similar to the problem you are to complete is given. Please use the example shown to help you follow along and solve your question. This assignment will be collected before you leave class today!

<p>Reference For #1</p> $\begin{aligned} x &= -3 \\ 4x + 3y &= -9 \\ 4(-3) + 3y &= -9 \\ -12 + 3y &= -9 \\ +12 & \\ \hline 3y &= 3 \\ y &= 1 \end{aligned}$ <p style="text-align: center;">Solution: (-3, 1)</p> <p style="text-align: center;"><u>Check</u>  <math>x = -3</math>  <math>-3 = -3 \checkmark</math>  <math>4x + 3y = -9</math>  <math>4(-3) + 3(1) = -9</math>  <math>-12 + 3 = -9</math>  <math>-9 = -9 \checkmark</math></p>	<p>1) <math>x = 5</math>  <math>5x - 2y = 29</math></p>
<p>Reference For #2</p> $\begin{aligned} y &= 3x + 2 \\ y &= -7x + 12 \\ 3x + 2 &= -7x + 12 \\ +7x & \\ \hline 10x + 2 &= 12 \\ -2 & \\ \hline 10x &= 10 \\ \frac{10x}{10} & \\ x &= 1 \end{aligned}$ <p style="text-align: center;">Solution (1, 5)</p> <p style="text-align: center;"><u>check</u>  <math>y = 3x + 2</math>  <math>5 = 3(1) + 2</math>  <math>5 = 3 + 2</math>  <math>5 = 5 \checkmark</math>  <math>y = -7x + 12</math>  <math>5 = -7(1) + 12</math>  <math>5 = -7 + 12</math>  <math>5 = 5 \checkmark</math></p>	<p>2) <math>y = -3x + 8</math>  <math>y = 2x - 12</math></p>

Reference for #3

$$\begin{aligned} x &= 9y - 5 \\ x &= -2y + 6 \end{aligned}$$

$$\begin{aligned} 9y - 5 &= -2y + 6 \\ +2y & \\ 11y - 5 &= 6 \end{aligned}$$

$$\begin{aligned} 11y &= 11 \\ +5 & \\ 11y &= 11 \end{aligned}$$

$$y = 1$$

$$\begin{aligned} x &= 9y - 5 \\ x &= 9(1) - 5 \\ x &= 9 - 5 \\ x &= 4 \end{aligned}$$

Solution  
(4, 1)

Check

$$\begin{aligned} x &= 9y - 5 \\ 4 &= 9(1) - 5 \\ 4 &= 9 - 5 \\ 4 &= 4 \checkmark \end{aligned}$$

$$\begin{aligned} x &= -2y + 6 \\ 4 &= -2(1) + 6 \\ 4 &= -2 + 6 \\ 4 &= 4 \checkmark \end{aligned}$$

3)  $x = -2y - 1$   
 $x = -4y + 5$

Reference for #4

$$\begin{aligned} 8x + 5y &= 8 \\ y &= 5x - 5 \end{aligned}$$

$$\begin{aligned} 8x + 5x - 5 &= 8 \\ 13x - 5 &= 8 \\ +5 & \\ 13x &= 13 \end{aligned}$$

$$\frac{13x}{13} = \frac{13}{13}$$

$$x = 1$$

$$\begin{aligned} y &= 5x - 5 \\ y &= 5(1) - 5 \\ y &= 5 - 5 \\ y &= 0 \end{aligned}$$

Solution  
(1, 0)

Check

$$\begin{aligned} 8x + y &= 8 \\ 8(1) + 0 &= 8 \\ 8 + 0 &= 8 \\ 8 &= 8 \checkmark \end{aligned}$$

Check

$$\begin{aligned} y &= 5x - 5 \\ 0 &= 5(1) - 5 \\ 0 &= 5 - 5 \\ 0 &= 0 \checkmark \end{aligned}$$

4)  $5x + y = 7$   
 $y = x - 5$

Reference for #5

$$\begin{aligned} x &= -2y + 1 \\ 3x + 7y &= 7 \end{aligned}$$

$$3(-2y + 1) + 7y = 7$$

$$-6y + 3 + 7y = 7$$

$$1y + 3 = 7$$

$$y - 3 = 7 - 3$$

$$\frac{1y}{1} = \frac{4}{1}$$

$$y = 4$$

Check

$$\begin{aligned} x &= -2y + 1 \\ -7 &= -2(4) + 1 \\ -7 &= -8 + 1 \\ -7 &= -7 \checkmark \end{aligned}$$

$$\begin{aligned} 3x + 7y &= 7 \\ 3(-7) + 7(4) &= 7 \\ -21 + 28 &= 7 \\ 7 &= 7 \checkmark \end{aligned}$$

$$\begin{aligned} x &= -2y + 1 \\ x &= -2(4) + 1 \\ x &= -8 + 1 \\ x &= -7 \end{aligned}$$

Solution  
(-7, 4)

5)  $x = 2y - 7$   
 $8x - 3y = 9$

Reference for #6

$$2x + 11y = 9$$

$$5x + y = 49$$

Solve for y

$$5x + y = 49$$

$$-5x \quad y = 49 - 5x$$

$$y = 49 - 5x$$

$$2x + 11y = 9$$

$$2x + 11(49 - 5x) = 9$$

$$2x + 539 - 55x = 9$$

$$-53x + 539 = 9$$

$$-53x - 539 = 9 - 539$$

$$-53x = -530$$

$$\frac{-53x}{-53} = \frac{-530}{-53}$$

$$x = 10$$

Check

$$\begin{aligned} 2x + 11y &= 9 \\ 2(10) + 11(-1) &= 9 \\ 20 - 11 &= 9 \\ 9 &= 9 \checkmark \end{aligned}$$

$$\begin{aligned} 5x + y &= 49 \\ 5(10) + (-1) &= 49 \\ 50 - 1 &= 49 \\ 49 &= 49 \checkmark \end{aligned}$$

$$\begin{aligned} y &= 49 - 5x \\ y &= 49 - 5(10) \\ y &= 49 - 50 \\ y &= -1 \end{aligned}$$

Solution  
(10, -1)

6)  $-5x + 7y = -65$   
 $3x + y = 13$