

Day 2 - Solving Systems Using Substitution - Practice

Directions: Solve each system using substitution. Write your solution as an ordered pair unless the system has no or infinite solutions.

1. $y = x - 1$
 $x + y = 3$

$$\begin{aligned} x + x - 1 &= 3 & y &= 2 - 1 \\ 2x - 1 &= 3 & y &= 1 \\ 2x &= 4 \\ x &= 2 \end{aligned}$$

Solution: $(2, 1)$

2. $4x + y = 0$

$x = -2y - 7$

$$\begin{aligned} 4(-2y - 7) + y &= 0 & x &= -2(-4) - 7 \\ -8y - 28 + y &= 0 & x &= 8 - 7 \\ -7y - 28 &= 0 & x &= 1 \\ -7y &= 28 \\ y &= -4 \end{aligned}$$

Solution: $(1, -4)$

3. $x = -5y + 4$
 $3x + 15y = -1$

$$\begin{aligned} 3(-5y + 4) + 15y &= -1 \\ -15y + 12 + 15y &= -1 \\ 12 &\neq -1 \end{aligned}$$

Solution: No Solution

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

$$\begin{aligned} -x - 2 &= 4x + 3 & y &= -(-1) - 2 \\ -5 &= 5x & y &= 1 - 2 \\ -1 &= x & y &= -1 \end{aligned}$$

Solution: $(-1, -1)$

5. $x + y = 16$
 $y = x + 1$

$$\begin{aligned} x + x + 1 &= 16 \\ 1 &\neq 16 \end{aligned}$$

Solution: No Solution

6. $y = 3x - 7$
 $3x - y = 7$

$$\begin{aligned} 3x - (3x - 7) &= 7 \\ 3x - 3x + 7 &= 7 \\ 7 &= 7 \end{aligned}$$

Solution: Infinite Solutions

$$7. \begin{cases} y = -2x + 6 \\ 3x - y = 9 \end{cases}$$

$$\begin{aligned} 3x - (-2x + 6) &= 9 \\ 3x + 2x - 6 &= 9 \\ 5x - 6 &= 9 \\ 5x &= 15 \\ x &= 3 \end{aligned}$$

Solution: $(3, 0)$

$$8. \begin{cases} y = -6x - 3 \\ y = -x + 2 \end{cases}$$

$$\begin{aligned} y &= -2(3) + 6 \\ y &= 0 \end{aligned} \quad \begin{aligned} -6x - 3 &= -x + 2 \\ -3 &= 5x + 2 \\ -5 &= 5x \\ -1 &= x \end{aligned} \quad \begin{aligned} y &= -6(-1) - 3 \\ y &= 3 \end{aligned}$$

Solution: $(-1, 3)$

$$9. \begin{cases} y = -3x + 25 \\ -x + 2y = -20 \end{cases}$$

$$\begin{aligned} -x + 2(-3x + 25) &= -20 \\ -x - 6x + 50 &= -20 \\ -7x + 50 &= -20 \\ -7x &= -70 \\ x &= 10 \end{aligned}$$

Solution:

$(10, -5)$

$$10. \begin{cases} x = y - 4 \\ x + 2y = 2 \end{cases}$$

$$\begin{aligned} y - 4 + 2y &= 2 \\ 3y - 4 &= 2 \\ 3y &= 6 \\ y &= 2 \end{aligned} \quad \begin{aligned} x &= 2 - 4 \\ x &= -2 \end{aligned}$$

Solution: $(-2, 2)$