

Solutions to WS 32.1 - Solving Systems of Equations by Substitution, #1-27 odd

#1-7: Determine whether the given point is a solution of the system.

① (2, 8)

$$\begin{cases} y = 3x + 2 \longrightarrow (8) \stackrel{?}{=} 3(2) + 2 \longrightarrow 8 = 8 \checkmark \\ y = 9x - 10 \longrightarrow (8) \stackrel{?}{=} 9(2) - 10 \longrightarrow 8 = 8 \checkmark \end{cases}$$

(2, 8) is a solution to this system.

③ (0, 9)

$$\begin{cases} 2y = 18x \longrightarrow 2(9) \stackrel{?}{=} 18(0) \longrightarrow 18 \neq 0 \times \\ 8x + y = 9 \longrightarrow 8(0) + (9) \stackrel{?}{=} 9 \longrightarrow 9 = 9 \checkmark \end{cases}$$

(0, 9) is not a solution to this system.

⑤ (7, 12)

$$\begin{cases} 6x - 2y = 22 \longrightarrow 6(7) - 2(12) \stackrel{?}{=} 22 \longrightarrow 18 \neq 22 \times \\ x - y = 5 \longrightarrow (7) - (12) \stackrel{?}{=} 5 \longrightarrow -5 \neq 5 \times \end{cases}$$

(7, 12) is not a solution to this system.

⑦ (10, -2)

$$\begin{cases} 7y + x = 14 \longrightarrow 7(-2) + (10) \stackrel{?}{=} 14 \longrightarrow -4 \neq 14 \times \\ x = 10 \longrightarrow (10) \stackrel{?}{=} 10 \longrightarrow 10 = 10 \checkmark \end{cases}$$

(10, -2) is not a solution to this system.

⑨ $\begin{cases} y = 3x - 2 \longrightarrow y = 3(4) - 2 \\ \boxed{x=4} \longrightarrow y = 12 - 2 \\ \underline{y = 10} \end{cases}$

(4, 10) is the solution to the system.

$$\textcircled{11} \begin{cases} y = 7x - 1 \\ y = -x + 14 \end{cases} \rightarrow \begin{array}{r} 7x - 1 = -x + 14 \\ +x \quad \quad +x \\ \hline 8x - 1 = 14 \\ 8x = 15 \\ x = 1.875 \end{array} \rightarrow \begin{array}{l} y = 7x - 1 \\ y = 7(1.875) - 1 \\ y = 13.125 - 1 \\ y = 12.125 \end{array}$$

$(1.875, 12.125)$ is the solution to the system.

$$\textcircled{13} \begin{cases} y = 2x + 9 \\ y = x + 5 \end{cases} \rightarrow \begin{array}{r} 2x + 9 = x + 5 \\ -x \quad \quad -x \\ \hline x + 9 = 5 \\ x = -4 \end{array} \rightarrow \begin{array}{l} y = x + 5 \\ y = (-4) + 5 \\ y = 1 \end{array}$$

$(-4, 1)$ is the solution to the system.

$$\textcircled{15} \begin{cases} y = 13x - 1 \\ y = 10x + 29 \end{cases} \rightarrow \begin{array}{r} 13x - 1 = 10x + 29 \\ -10x \quad -10x \\ \hline 3x - 1 = 29 \\ 3x = 30 \\ x = 10 \end{array} \rightarrow \begin{array}{l} y = 13x - 1 \\ y = 13(10) - 1 \\ y = 130 - 1 \\ y = 129 \end{array}$$

$(10, 129)$ is the solution to the system.

$$\textcircled{17} \begin{cases} y = x + 2 \\ y = -x - 2 \end{cases} \rightarrow \begin{array}{r} x + 2 = -x - 2 \\ +x \quad \quad +x \\ \hline 2x + 2 = -2 \\ 2x = -4 \\ x = -2 \end{array} \rightarrow \begin{array}{l} y = x + 2 \\ y = (-2) + 2 \\ y = 0 \end{array}$$

$(-2, 0)$ is the solution to the system.

$$\textcircled{19} \begin{cases} y = 6x + 7 \\ y = 10x + 11 \end{cases} \rightarrow \begin{array}{r} 10x + 11 = 6x + 7 \\ -6x \quad \quad -6x \\ \hline 4x + 11 = 7 \\ 4x = -4 \\ x = -1 \end{array} \rightarrow \begin{array}{l} y = 6x + 7 \\ y = 6(-1) + 7 \\ y = -6 + 7 \\ y = 1 \end{array}$$

$(-1, 1)$ is the solution to the system.

21)
$$\begin{cases} y = 8x - 2 \\ y = 5x - 0.5 \end{cases} \rightarrow \begin{array}{r} 8x - 2 = 5x - 0.5 \\ -5x \quad -5x \\ \hline 3x - 2 = -0.5 \\ 3x = 1.5 \\ \underline{x = 0.5} \end{array}$$

$(0.5, 2)$ is the solution to the system.

$$\begin{aligned} y &= 8x - 2 \\ y &= 8(0.5) - 2 \\ y &= 4 - 2 \\ \underline{y} &= \underline{2} \end{aligned}$$

23)
$$\begin{cases} y = 2x + 8 \\ y = x - 7 \end{cases} \rightarrow \begin{array}{r} x - 7 = 2x + 8 \\ -2x \quad -2x \\ \hline -1x - 7 = 8 \\ -1x = 15 \\ \underline{x = -15} \end{array}$$

$(-15, -22)$ is the solution to the system.

$$\begin{aligned} y &= 2x + 8 \\ y &= 2(-15) + 8 \\ y &= -30 + 8 \\ \underline{y} &= \underline{-22} \end{aligned}$$

25)
$$\begin{cases} y = 9x - 4 \\ y = 13x + 2 \end{cases} \rightarrow \begin{array}{r} 13x + 2 = 9x - 4 \\ -9x \quad -9x \\ \hline 4x + 2 = -4 \\ 4x = -6 \\ \underline{x = -1.5} \end{array}$$

$(-1.5, -17.5)$ is the solution to the system.

$$\begin{aligned} y &= 9x - 4 \\ y &= 9(-1.5) - 4 \\ y &= -13.5 - 4 \\ \underline{y} &= \underline{-17.5} \end{aligned}$$

27)
$$\begin{cases} y = 13x + 17 \\ x = -1 \end{cases} \rightarrow \begin{array}{l} y = 13(-1) + 17 \\ y = -13 + 17 \\ \underline{y = 4} \end{array}$$

$(-1, 4)$ is the solution to the system.