

Section 2: Solving Systems of Equations by Substitution

23. What is the value of x in the system of equations below?

$$\begin{aligned} y + 3x &= 10 \\ 2x - 5y &= 1 \end{aligned} \rightarrow \begin{aligned} y + 3x &= 10 \\ -3x - 3x & \end{aligned}$$

- A. -1
B. 1
C. -3
D. 3

$$\begin{aligned} y &= -3x + 10 \\ 2x - 5y &= 1 \\ 2x - 5(-3x + 10) &= 1 \\ 2x + 15x - 50 &= 1 \\ 17x - 50 &= 1 \\ 17x &= 51 \\ x &= 3 \end{aligned}$$

24. Use substitution to solve the system of equations below. find both x and y

$$\begin{aligned} 7w - 4z &= -16 \\ z &= 3w - 1 \end{aligned}$$

$$\begin{aligned} 7w - 4z &= -16 \\ 7w - 4(3w - 1) &= -16 \\ 7w - 12w + 4 &= -16 \\ -5w + 4 &= -16 \\ -5w &= -20 \\ w &= 4 \end{aligned}$$

$$\begin{aligned} z &= 3(4) - 1 \\ z &= 12 - 1 \\ z &= 11 \end{aligned}$$

$$\begin{pmatrix} w & z \\ 4 & 11 \end{pmatrix}$$

Solution

Section 3: Solving Systems of Equations by Elimination

25. Use elimination to find the solution of the system of equations below. find both a

$$\begin{aligned} 5a + 4b &= -3 \\ -5 \cdot (a + 3b &= 6) \end{aligned}$$

$$\begin{aligned} 5a + 4b &= -3 \\ + \quad -5a - 15b &= -30 \\ \hline \end{aligned}$$

↓ add down

$$\begin{aligned} -11b &= -33 \\ -11 & \quad -11 \end{aligned}$$

$$b = 3$$

$$\begin{aligned} a + 3b &= 6 \\ a + 3(3) &= 6 \\ a + 9 &= 6 \\ a &= -3 \end{aligned}$$

$$\begin{pmatrix} a & b \\ -3 & 3 \end{pmatrix}$$

26. What is the value of m in the system of equations below?

$$\begin{aligned} 2m + 3n &= 1 \\ 3 \cdot (4m - n &= 9) \end{aligned}$$

- A. -1
B. 1
C. -2
D. 2

$$\begin{aligned} 2m + 3n &= 1 \\ + \quad 12m - 3n &= 27 \\ \hline 14m &= 28 \\ 14 & \quad 14 \end{aligned}$$

$$m = 2$$