

Review Exercise Set 22

Exercise 1: Determine the solution of the following system of equations by using the addition method.

$$x - 4y = 12$$

$$2x + 5y = -2$$

Exercise 2: Determine the solution of the following system of equations by using the addition method.

$$3x + 10y = -33$$

$$6x - 7y = 15$$

Exercise 3: Determine the solution of the following system of equations by using the addition method.

$$3x + y = -9$$

$$4x - 3y = 1$$

Exercise 4: Determine the solution of the following system of equations by using the addition method.

$$-x + 2y = 10$$

$$3x - y = -10$$

Exercise 5: Determine the solution of the following system of equations by using the addition method.

$$6x - 5y = 1$$

$$4x - 7y = 2$$

Review Exercise Set 22 Answer Key

Exercise 1: Determine the solution of the following system of equations by using the addition method.

$$\begin{aligned}x - 4y &= 12 \\ 2x + 5y &= -2\end{aligned}$$

Multiply the first equation by -2

$$\begin{aligned}-2(x - 4y &= 12) \\ -2x + 8y &= -24\end{aligned}$$

Add the new equation to the second equation to eliminate x and solve for y

$$\begin{aligned}2x + 5y &= -2 \\ -2x + 8y &= -24 \\ \hline 13y &= -26 \\ y &= -2\end{aligned}$$

Substitute the value of y into one of the original equations to find x

$$\begin{aligned}x - 4y &= 12 \\ x - 4(-2) &= 12 \\ x + 8 &= 12 \\ x &= 12 - 8 \\ x &= 4\end{aligned}$$

The solution for the system of equations is (4, -2).

Exercise 2: Determine the solution of the following system of equations by using the addition method.

$$\begin{aligned}3x + 10y &= -33 \\ 6x - 7y &= 15\end{aligned}$$

Multiply the first equation by -2

$$\begin{aligned}-2(3x + 10y &= -33) \\ -6x - 20y &= 66\end{aligned}$$

Add the new equation to the second equation to eliminate x and solve for y

$$\begin{aligned}6x - 7y &= 15 \\ -6x - 20y &= 66 \\ \hline -27y &= 81 \\ y &= -3\end{aligned}$$

Exercise 2 (Continued):

Substitute the value of y into one of the original equations to find x

$$\begin{aligned}3x + 10y &= -33 \\3x + 10(-3) &= -33 \\3x - 30 &= -33 \\3x &= -33 + 30 \\3x &= -3 \\x &= -1\end{aligned}$$

The solution for the system of equations is $(-1, -3)$.

Exercise 3: Determine the solution of the following system of equations by using the addition method.

$$\begin{aligned}3x + y &= -9 \\4x - 3y &= 1\end{aligned}$$

Multiply the first equation by 3

$$\begin{aligned}3(3x + y = -9) \\9x + 3y &= -27\end{aligned}$$

Add the new equation to the second equation to eliminate y and solve for x

$$\begin{array}{r}4x - 3y = 1 \\ \underline{9x + 3y = -27} \\13x \quad = -26 \\x = -2\end{array}$$

Substitute the value of x into one of the original equations to find y

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

The solution for the system of equations is $(-2, -3)$.

Exercise 4: Determine the solution of the following system of equations by using the addition method.

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

Multiply the first equation by 3

$$\begin{aligned} 3(-x + 2y) &= 3(10) \\ -3x + 6y &= 30 \end{aligned}$$

Add the new equation to the second equation to eliminate x and solve for y

$$\begin{array}{r} 3x - y = -10 \\ -3x + 6y = 30 \\ \hline 5y = 20 \\ y = 4 \end{array}$$

Substitute the value of y into one of the original equations to find x

$$\begin{aligned} 3x - y &= -10 \\ 3x - (4) &= -10 \\ 3x &= -10 + 4 \\ 3x &= -6 \\ x &= -2 \end{aligned}$$

The solution for the system of equations is (-2, 4).

Exercise 5: Determine the solution of the following system of equations by using the addition method.

$$\begin{aligned} 6x - 5y &= 1 \\ 4x - 7y &= 2 \end{aligned}$$

Multiply the first equation by 2

$$\begin{aligned} 2(6x - 5y) &= 2(1) \\ 12x - 10y &= 2 \end{aligned}$$

Multiply the second equation by -3

$$\begin{aligned} -3(4x - 7y) &= -3(2) \\ -12x + 21y &= -6 \end{aligned}$$

Exercise 5 (Continued):

Add the two new equations together to eliminate x and solve for y

$$\begin{array}{r} 12x - 10y = 2 \\ -12x + 21y = -6 \\ \hline 11y = -4 \\ y = -\frac{4}{11} \end{array}$$

Substitute the value of y into one of the original equations to find x

$$\begin{aligned} 6x - 5y &= 1 \\ 6x - 5\left(-\frac{4}{11}\right) &= 1 \\ 6x + \frac{20}{11} &= 1 \\ 11\left(6x + \frac{20}{11}\right) &= 11(1) \\ 66x + 20 &= 11 \\ 66x &= 11 - 20 \\ 66x &= -9 \\ x &= -\frac{9}{66} \\ x &= -\frac{3}{22} \end{aligned}$$

The solution for the system of equations is $\left(-\frac{3}{22}, -\frac{4}{11}\right)$.