NCERT SOLUTIONS FOR CLASS 9 MATHEMATICS

Chapter 4: Linear Equations in Two Variables

EXERCISE 4.2

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1. Which one of the following options is true, and why?

y = 3x + 5 has

i) a unique solution

ii) only two solutions

iii) infinitely many solutions

Answer:

y =3x + 5 has infinitely many solutions, because for every value of x, there is a corresponding value of y and vice versa.

For example, if x= 0, y = 3(0) + 5 = 5

Therefore, (0, 5) is a solution.

If x = 1, y = 3(1) + 5= 8

Therefore, (1, 8) is a solution.

So, for different values of x, we will get different values of y also.

2. Write four solutions for each of the following equations:

i) 2x + y = 7

ii) $\pi x + y = 9$

iii) x = 4y

Answer:

i) 2x + y = 7

y = 7 – 2x

Put x = 0, then y = 7 – 2 (0) = 7

Put x = 1, then y = 7 – 2(1) = 7 – 2 = 5

Put x = 2, then y = 7 – 2(2) = 7 – 4 = 3

Put x =3, then y = 7 – 2(3) = 7- 6 = 1

Therefore, four solutions are (0, 7), (1, 5), (2, 3) and (3, 1)

ii) πx + y = 9

y = 9 – πx

Put x = 0, then y = 9 – π (0) = 9

Put x = 1, then y = 9 – π(1) = 9 – π

Put x = -1, then y = 9 – π (-1) = 9 + π

Put x = $\frac{9}{\pi}$, then y = 9 – π ($\frac{9}{\pi}$) = 9 – 9 = 0

Therefore, four solutions are (0, 9), (1, 9-π), (-1, 9+π) and ($\frac{9}{\pi}$, 0)

iii) x = 4y

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

Put x=0, then y = $\frac{0}{4}$ = 0

Put x = 4, then y = $\frac{4}{4}$ = 1

Put x = -4, then y = $\frac{-4}{4}$ = -1

Put x = 2, then y = $\frac{2}{4}$ = $\frac{1}{2}$

Therefore, four solutions are (0, 0), (4, 1) (-4, -1) and (2,$\frac{1}{2}$)

3. Check which of the following are solutions of the equation x – 2y = 4 and which are not:

i) (0, 2)

ii) (2, 0)

iii) (4, 0)

iv) ($\sqrt{2}$, $4\sqrt{2}$)

v) (1, 1)

Answer:

Given equation is x – 2y = 4

i) (0, 2)

Put x = 0 and y = 2 in the given equation, we get x – 2y = 0 – 2(2) = 0 -4 = -4, which is not 4.

Therefore, (0, 2) is not a solution of the given equation.

ii) (2, 0)

Put x = 2 and y = 0 in the given equation, we get x – 2y = 2 – 2(0) = 2-0 = 2, which is not 4.

Therefore, (2, 0) is not a solution of the given equation.

iii) (4, 0)

Put x =4 and y= 0 in the given equation, we get x – 2y = 4 – 2(0) = 4 – 0 = 4, which is 4.

Therefore, (4, 0) is a solution of the given equation.

iv) ($\sqrt{2}$, $4\sqrt{2}$)

Put x = $\sqrt{2}$ and y = $4\sqrt{2}$ in the given equation, we get x – 2y = $\sqrt{2}$ - 2($4\sqrt{2}$), which is not 4.

Therefore, ($\sqrt{2}$, $4\sqrt{2}$) is not a solution of the given equation.

v) (1, 1)

Put x = 1 and y =1 in the given equation, we get x – 2y = 1 – 2 (1) = -1, which is not 4.

Therefore, (1, 1) is not a solution of this equation.

4. Find the value of k, if x = 2, y=1 is a solution of the equation 2x + 3y = k

Answer:

Given equation is 2x + 3y = k

Put x = 2, y=1 in the given equation, we get 2 (2) + 3(1) = k

4 + 3 = k

7 = k

Hence the value of k is 7.
