Exercise 4.1   Page: 68

1. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement.
(Take the cost of a notebook to be ₹ x and that of a pen to be ₹ y)
Solution:

Let the cost of a notebook to be = ₹ x
Let the cost of a pen to be   = ₹ y

According to the question,
The cost of a notebook is twice the cost of a pen.
i.e., Cost of a notebook = 2×Cost of a pen
$$x = 2 \times y$$
$$\Longrightarrow \qquad x = 2y$$
$$\Longrightarrow \qquad x-2y = 0$$
∴ x-2y = 0 is the linear equation in two variables to represent the statement 'The cost of a notebook is twice the cost of a pen'.

2. Express the following linear equations in the form ax + by + c = 0 and indicate the values of a, b and c in each case:

(i) 2x+3y = 9.3$\bar{5}$
Solution:
$$2x+3y = 9.3\bar{5}$$
Re-arranging the equation, we get,
$$2x+3y-9.3\bar{5}= 0$$
The equation $2x + 3y - 9.3\bar{5}= 0$ can be written as,
$$2x + 3y + (-9.3\bar{5}) = 0$$
Now comparing $2x + 3y +(-9.3\bar{5}) = 0$ with $ax + by + c = 0$
We get,
$$a = 2$$
$$b = 3$$
$$c = -9.3\bar{5}$$

(ii) x –(y/5)–10 = 0
Solution:

The equation x –(y/5)-10 = 0 can be written as,
$$1x+(-1/5)y +(-10) = 0$$
Now comparing x+(-1/5)y+(–10) = 0 with ax+by+c = 0
We get,
$$a = 1$$
$$b = -(1/5)$$
$$c = -10$$

(iii) –2x+3y = 6
Solution:

$$-2x+3y = 6$$

Re-arranging the equation, we get,

$$-2x+3y-6 = 0$$

The equation –2x+3y–6 = 0 can be written as,

$$(-2)x+3y+(-6) = 0$$

Now comparing (–2)x+3y+(–6) = 0 with ax+by+c = 0

We get,   a = –2

            b = 3

            c = –6

(iv) x = 3y
Solution:

$$x = 3y$$

Re-arranging the equation, we get,

$$x-3y = 0$$

The equation x-3y=0 can be written as,

$$1x+(-3)y+(0)c = 0$$

Now comparing 1x+(-3)y+(0)c = 0 with ax+by+c = 0

We get,   a = 1

            b = -3

            c =0

(v) 2x = –5y
Solution:

$$2x = -5y$$

Re-arranging the equation, we get,

$$2x+5y = 0$$

The equation 2x+5y = 0 can be written as,

$$2x+5y+0 = 0$$

Now comparing 2x+5y+0= 0 with ax+by+c = 0

We get,   a = 2

            b = 5

            c = 0

(vi) 3x+2 = 0
Solution:

$$3x+2 = 0$$

The equation 3x+2 = 0 can be written as,

$$3x+0y+2 = 0$$

Now comparing 3x+0+2= 0 with ax+by+c = 0

We get,   a = 3

            b = 0

            c = 2

(vii) y–2 = 0
Solution:

$$y-2 = 0$$

The equation y–2 = 0 can be written as,

0x+1y+(–2) = 0

Now comparing 0x+1y+(–2) = 0with ax+by+c = 0

We get,   a = 0

                 b = 1

                 c = –2

(viii) 5 = 2x

Solution:

          5 = 2x

Re-arranging the equation, we get,

          2x = 5

i.e.,   2x–5   = 0

The equation 2x–5 = 0 can be written as,

          2x+0y–5 = 0

Now comparing 2x+0y–5 = 0 with ax+by+c = 0

We get,   a = 2

                 b = 0

                 c = -5