

Ex 3.3 Question 1

$$1 \text{ (i) } \begin{aligned} x + y &= 14 \dots \text{(i)} \\ x - y &= 4 \dots \text{(ii)} \\ \Rightarrow x &= 4 + y \dots \text{(iii)} \end{aligned}$$

Subs. value of x from (iii) in (i)

$$\begin{aligned} 4 + y + y &= 14 \\ \Rightarrow 2y &= 14 - 4 \\ \Rightarrow y &= \frac{10}{2} = 5 \end{aligned}$$

$$\Rightarrow y = 5$$

Subs. value of y in (iii)

$$\begin{aligned} x &= 4 + 5 \\ &= 9 \end{aligned}$$

$$\therefore x = 9, y = 5$$

$$\text{(ii) } \begin{aligned} s - t &= 3 \dots \text{(i)} \\ \frac{s}{3} + \frac{t}{2} &= 6 \dots \text{(ii)} \end{aligned}$$

From (i) $s = 3 + t \dots \text{(iii)}$
substituting value of s from (iii) in (ii)

$$\frac{3+t}{3} + \frac{t}{2} = 6$$

multiplying eqn by 6

$$\begin{aligned} 2(3+t) + 3t &= 36 \\ \Rightarrow 6 + 2t + 3t &= 36 \\ \Rightarrow 5t &= 36 - 6 \\ \Rightarrow t &= \frac{30}{5} = 6 \end{aligned}$$

Subs. value of t in (iii)

$$\begin{aligned} s &= 3 + 6 \\ &= 9 \end{aligned}$$

$$\therefore s = 9, t = 6$$

$$\text{(iii) } \begin{aligned} 3x - y &= 3 \dots \text{(i)} \\ 9x - 3y &= 9 \dots \text{(ii)} \end{aligned}$$

From (i) $y = 3x - 3 \dots \text{(iii)}$
Sub. value of y in (ii) from (iii)

$$\begin{aligned} 9x - 3(3x - 3) &= 9 \\ \Rightarrow 9x - 9x + 9 &= 9 \\ \Rightarrow 9 &= 9 \text{ which is always true} \\ \therefore \text{Pair of eqns has infinitely many solutions} \end{aligned}$$