

$$1(iii) \quad \frac{4}{x} + 3y = 14$$

Put $\frac{1}{x} = a$

$$4a + 3y = 14 \dots (i)$$

$$\frac{3}{x} - 4y = 23$$

Put $\frac{1}{x} = a$

$$3a - 4y = 23 \dots (ii)$$

$$(i) \times 4 + (ii) \times 3$$

$$16a + 12y = 56$$

$$9a - 12y = 69$$

$$25a = 125$$

$$\Rightarrow a = \frac{125}{25} = 5$$

$$\Rightarrow a = 5$$

Sub. (i)

$$4 \times 5 + 3y = 14$$

$$\Rightarrow 3y = 14 - 20$$

$$\Rightarrow y = \frac{-6}{3} = -2$$

$$\Rightarrow y = -2$$

$$a = 5 \quad | \quad y = -2$$

$$\frac{1}{x} = 5$$

$$\Rightarrow x = \frac{1}{5}$$

$$1(iv) \quad \frac{5}{x-1} + \frac{1}{y-2} = 2$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$

Put $\frac{1}{x-1} = a, \frac{1}{y-2} = b$

in both eqns

$$5a + b = 2 \dots (i)$$

$$6a - 3b = 1 \dots (ii)$$

$$(i) \times 3 + (ii) \times 1$$

$$15a + 3b = 6$$

$$6a - 3b = 1$$

$$21a = 7$$

$$\Rightarrow a = \frac{7}{21} = \frac{1}{3}$$

$$\Rightarrow a = \frac{1}{3}$$

Sub. in (ii)

$$2 \times \frac{1}{3} - 3b = 1$$

$$\Rightarrow \frac{2}{3} - 3b = 1$$

$$\Rightarrow -3b = 1 - \frac{2}{3}$$

$$\Rightarrow b = \frac{1}{3}$$

$$a = \frac{1}{3} \quad | \quad b = \frac{1}{3}$$

$$\frac{1}{x-1} = \frac{1}{3}$$

$$\Rightarrow x-1 = 3$$

$$\Rightarrow x = 4$$

$$\frac{1}{y-2} = \frac{1}{3}$$

$$\Rightarrow y-2 = 3$$

$$\Rightarrow y = 5$$