Brainbox learn easy

Chapter 04

LINEAR EQUATIONS IN TWO VARIABLES

Example:

Solve $\frac{5}{x}+\frac{3}{y}=2$ and $\frac{6}{x}-\frac{4}{y}=10$.

Solution:

Given $\frac{5}{x}+\frac{3}{y}=2$ and $\frac{6}{x}-\frac{4}{y}=10$

Let $\frac{1}{x}=a, \frac{1}{y}=b$ then given equation becomes

$$5a+3b=2 \rightarrow (1)$$

$$6a-4b=10 \rightarrow (2)$$

$(1)\times 4 \Rightarrow 20a+12b=8 \rightarrow (3)$

$(2)\times 3 \Rightarrow 18a-12b=30 \rightarrow (4)$

$(3)+(4) \Rightarrow 38a=38$

$$\Rightarrow a=\frac{38}{38}=1$$

$$\Rightarrow \boxed{a=1}$$

Substitute the value of "a" in eq(1)

$5(1)+3b=2$

$\Rightarrow 5+3b=2$

$\Rightarrow 3b=-3$

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

$\Rightarrow \boxed{b = -1}$

But,

$\frac{1}{x} = a$	$\frac{1}{y} = b$
$\Rightarrow \frac{1}{x} = 1$	$\Rightarrow \frac{1}{y} = -1$
$\Rightarrow \boxed{x = 1}$	$\Rightarrow \boxed{y = -1}$

$\therefore$ The solution set is $\{1, -1\}$.