

Que: solve $\frac{1}{x-3} - \frac{1}{x+5} = \frac{1}{6}$

Solⁿ: $\Rightarrow \frac{(x+5) - (x-3)}{(x-3)(x+5)} = \frac{1}{6}$

$$\Rightarrow \frac{x+5-x+3}{(x-3)(x+5)} = \frac{1}{6}$$

$$\Rightarrow \frac{8}{(x-3)(x+5)} = \frac{1}{6}$$

$$\Rightarrow 48 = (x-3)(x+5)$$

$$\Rightarrow 48 = x^2 + 5x - 3x - 15$$

$$\Rightarrow x^2 + 2x - 15 - 48 = 0$$

$$\Rightarrow x^2 + 2x - 63 = 0$$

$$\Rightarrow x^2 + 9x - 7x - 63 = 0$$

$$\Rightarrow x(x+9) - 7(x+9) = 0$$

$$\Rightarrow (x+9)(x-7) = 0$$

$$\text{Either } x(x+9) = 0 \Rightarrow x = -9$$

$$\text{or, } (x-7) = 0 \Rightarrow x = 7$$

$\therefore 7, -9$ are the required values of x Ans.