Quadratic Equations Ex 8.3 Q48

Answer :

We have been given

$$\frac{1}{x+4}-\frac{1}{x-7}=\frac{11}{30}$$

$$\frac{-11}{x^2-3x-28}=\frac{11}{30}$$

$$-30=x^2-3x-28$$

$$x^2-3x+2=0$$

Now we solve the above quadratic equation using factorization method.

Therefore,

$$x^2-2x-x+2=0$$

$$x(x-2)-1(x-2)=0$$

$$(x-1)(x-2)=0$$

Now, one of the products must be equal to zero for the whole product to be zero. Hence we equate both the products to zero in order to find the value of x.

Therefore,

$$x-1=0$$

$$x=1$$

Or

$$x-2=0$$

$$x=2$$

Hence, $\boxed{x=1}$ or $\boxed{x=2}$.

Quadratic Equations Ex 8.3 Q49

Answer :

$$\frac{1}{x-3}+\frac{2}{x-2}=\frac{8}{x}$$

$$\Rightarrow \frac{(x-2)+2(x-3)}{(x-3)(x-2)}=\frac{8}{x}$$

$$\Rightarrow \frac{x-2+2x-6}{x^2-2x-3x+6}=\frac{8}{x}$$

$$\Rightarrow \frac{3x-8}{x^2-5x+6}=\frac{8}{x}$$

$$\Rightarrow x(3x-8)=8(x^2-5x+6)$$

$$\Rightarrow 3x^2-8x=8x^2-40x+48$$

$$\Rightarrow 5x^2-32x+48=0$$

$$\Rightarrow 5x^2-20x-12x+48=0$$

$$\Rightarrow 5x(x-4)-12(x-4)=0$$

$$\Rightarrow (5x-12)(x-4)=0$$

$$\Rightarrow 5x-12=0 \text{ or } x-4=0$$

$$\Rightarrow x=\frac{12}{5} \text{ or } x=4$$

Hence, the factors are 4 and $\frac{12}{5}$.

Quadratic Equations Ex 8.3 Q50

Answer :

$$\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$$

$$\Rightarrow \frac{1}{2a+b+2x} - \frac{1}{2a} = \frac{1}{b} + \frac{1}{2x}$$

$$\Rightarrow \frac{2a-(2a+b+2x)}{(2a+b+2x)(2a)} = \frac{2x+b}{2bx}$$

$$\Rightarrow \frac{-b-2x}{4a^2+2ab+4ax} = \frac{2x+b}{2bx}$$

$$\Rightarrow \frac{-1(2x+b)}{4a^2+2ab+4ax} = \frac{2x+b}{2bx}$$

$$\Rightarrow -2bx(2x+b) = (4a^2+2ab+4ax)(2x+b)$$

$$\Rightarrow (4a^2+2ab+4ax)(2x+b) + 2bx(2x+b) = 0$$

$$\Rightarrow (2x+b)(4a^2+2ab+4ax+2bx) = 0$$

$$\Rightarrow 2x+b = 0 \text{ or } 4a^2+2ab+(4a+2b)x = 0$$

$$\Rightarrow x = -\frac{b}{2} \text{ or } x = -\frac{4a^2+2ab}{4a+2b}$$

$$\Rightarrow x = -\frac{b}{2} \text{ or } x = -\frac{a(4a+2b)}{4a+2b}$$

$$\Rightarrow x = -\frac{b}{2} \text{ or } x = -a$$

Hence, the factors are $-a$ and $-\frac{b}{2}$.

Quadratic Equations Ex 8.3 Q51

Answer :

$$\frac{4}{x} - 3 = \frac{5}{2x+3}$$

$$\Rightarrow \frac{4-3x}{x} = \frac{5}{2x+3}$$

$$\Rightarrow (4-3x)(2x+3) = 5x$$

$$\Rightarrow 8x + 12 - 6x^2 - 9x = 5x$$

$$\Rightarrow -6x^2 - 6x + 12 = 0$$

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

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

$$\Rightarrow x\Big(x+2\Big) - 1\Big(x+2\Big) = 0$$

$$\Rightarrow \Big(x-1\Big)\Big(x+2\Big) = 0$$

$$\Rightarrow x - 1 = 0 \text{ or } x + 2 = 0$$

$$\Rightarrow x = 1 \text{ or } x = -2$$

Hence, the factors are 1 and –2.

********** END **********