



Quadratic Equations Ex 8.4 Q4

Answer :

We have been given that,

$$2x^2 + x - 4 = 0$$

Now divide throughout by 2. We get,

$$x^2 + \frac{1}{2}x - 2 = 0$$

Now take the constant term to the RHS and we get

$$x^2 + \frac{1}{2}x = 2$$

Now add square of half of co-efficient of 'x' on both the sides. We have,

$$x^2 + \frac{1}{2}x + \left(\frac{1}{4}\right)^2 = \left(\frac{1}{4}\right)^2 + 2$$

$$x^2 + \left(\frac{1}{4}\right)^2 + 2\left(\frac{1}{4}\right)x = \frac{33}{16}$$

$$\left(x + \frac{1}{4}\right)^2 = \frac{33}{16}$$

Since RHS is a positive number, therefore the roots of the equation exist.

So, now take the square root on both the sides and we get

$$x + \frac{1}{4} = \pm \frac{\sqrt{33}}{4}$$

$$x = \frac{-1 \pm \sqrt{33}}{4}$$

Now, we have the values of 'x' as

$$x = \frac{-1 + \sqrt{33}}{4}$$

Also we have,

$$x = \frac{-1 - \sqrt{33}}{4}$$

Therefore the roots of the equation are $\boxed{\frac{\sqrt{33}-1}{4}}$ and $\boxed{\frac{-1-\sqrt{33}}{4}}$.

Quadratic Equations Ex 8.4 Q5

Answer :

We have been given that,

$$2x^2 + x + 4 = 0$$

Now divide throughout by 2. We get,

$$x^2 + \frac{1}{2}x + 2 = 0$$

Now take the constant term to the RHS and we get

$$x^2 + \frac{1}{2}x = -2$$

Now add square of half of co-efficient of 'x' on both the sides. We have,

$$\begin{aligned}x^2 + \frac{1}{2}x + \left(\frac{1}{4}\right)^2 &= \left(\frac{1}{4}\right)^2 - 2 \\x^2 + \left(\frac{1}{4}\right)^2 + 2\left(\frac{1}{4}\right)x &= \frac{-31}{16} \\ \left(x + \frac{1}{4}\right)^2 &= -\frac{31}{16}\end{aligned}$$

Since RHS is a negative number, therefore the roots of the equation do not exist as the square of a number cannot be negative.

Therefore the roots of the equation do not exist.

Quadratic Equations Ex 8.4 Q6

Answer :

We have been given that,

$$4x^2 + 4\sqrt{3}x + 3 = 0$$

Now divide throughout by 4. We get,

$$x^2 + \sqrt{3}x + \frac{3}{4} = 0$$

Now take the constant term to the RHS and we get

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

Now add square of half of co-efficient of 'x' on both the sides. We have,

$$\begin{aligned}x^2 + 2\left(\frac{\sqrt{3}}{2}\right)x + \left(\frac{\sqrt{3}}{2}\right)^2 &= \left(\frac{\sqrt{3}}{2}\right)^2 - \frac{3}{4} \\x^2 + 2\left(\frac{\sqrt{3}}{2}\right)x + \left(\frac{\sqrt{3}}{2}\right)^2 &= 0 \\ \left(x + \frac{\sqrt{3}}{2}\right)^2 &= 0\end{aligned}$$

Since RHS is a positive number, therefore the roots of the equation exist.

So, now take the square root on both the sides and we get

$$\begin{aligned}x + \frac{\sqrt{3}}{2} &= 0 \\ x &= -\frac{\sqrt{3}}{2}\end{aligned}$$

Now, we have the values of 'x' as

$$x = -\frac{\sqrt{3}}{2}$$

Also we have,

$$x = -\frac{\sqrt{3}}{2}$$

Therefore the roots of the equation are $\boxed{-\frac{\sqrt{3}}{2}}$ and $\boxed{-\frac{\sqrt{3}}{2}}$.

***** END *****

