Quadratic Equations Ex 8.4 Q1

Answer :

We have been given that,

$x^2-4\sqrt{2}x+6=0$

Now we take the constant term to the right hand side and we get

$x^2-4\sqrt{2}x=-6$

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

$$x^2-4\sqrt{2}x+\left(2\sqrt{2}\right)^2=\left(2\sqrt{2}\right)^2-6$$

$$x^2+\left(2\sqrt{2}\right)^2-2\left(2\sqrt{2}\right)x=2$$

$$\left(x-2\sqrt{2}\right)^2=2$$

Since right hand side is a positive number, the roots of the equation exist.

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

$$x-2\sqrt{2}=\pm\sqrt{2}$$

$$x=2\sqrt{2}\pm\sqrt{2}$$

Now, we have the values of 'x' as

$$x=2\sqrt{2}+\sqrt{2}$$

$$=3\sqrt{2}$$

Also we have,

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

$$=\sqrt{2}$$

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

Quadratic Equations Ex 8.4 Q2

Answer :

We have to find the roots of given quadratic equation by the method of completing the square. We have,

$2x^2-7x+3=0$

We should make the coefficient of x^2 unity. So,

$$x^2-\frac{7}{2}x+\frac{3}{2}=0$$

Now shift the constant to the right hand side,

$$x^2-\frac{7}{2}x=-\frac{3}{2}$$

Now add square of half of coefficient of x on both the sides,

$$x^2-2\left(\frac{7}{4}\right)x+\left(\frac{7}{4}\right)^2=-\frac{3}{2}+\left(\frac{7}{4}\right)^2$$

We can now write it in the form of perfect square as,

$$\left(x-\frac{7}{4}\right)^2=-\frac{3}{2}+\frac{49}{16}$$

$$=\frac{25}{16}$$

Taking square root on both sides,

$$\left(x-\frac{7}{4}\right)=\sqrt{\frac{25}{16}}$$

So the required solution of x ,

$$x=\frac{7}{4}\pm\frac{5}{4}$$

$$=\boxed{3,\frac{1}{2}}$$

Quadratic Equations Ex 8.4 Q3

Answer :

We have been given that,

$3x^2+11x+10=0$

Now divide throughout by 3. We get,

$x^2+\frac{11}{3}x+\frac{10}{3}=0$

Now take the constant term to the RHS and we get

$x^2+\frac{11}{3}x=-\frac{10}{3}$

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

$$x^2+\frac{11}{3}x+\left(\frac{11}{6}\right)^2=\left(\frac{11}{6}\right)^2-\frac{10}{3}$$

$$x^2+\left(\frac{11}{6}\right)^2+2\left(\frac{11}{3}\right)x=\frac{1}{36}$$

$$\left(x+\frac{11}{6}\right)^2=\frac{1}{36}$$

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

$$x+\frac{11}{6}=\pm\frac{1}{6}$$

$$x=-\frac{11}{6}\pm\frac{1}{6}$$

Now, we have the values of 'x' as

$$x = -\frac{11}{6} + \frac{1}{6}$$
$$= -\frac{5}{3}$$

Also we have,

$$x = -\frac{11}{6} - \frac{1}{6}$$
$$= -2$$

Therefore the roots of the equation are $\boxed{-2}$ and $\boxed{-\frac{5}{3}}$.

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