



Quadratic Equations Ex 8.6 Q4

Answer :

The given quadric equation is $(4-k)x^2 + (2k+4)x + (8k+1) = 0$, and roots are real and equal

Then find the value of k .

Here, $a = (4-k)$, $b = (2k+4)$ and $c = (8k+1)$

As we know that $D = b^2 - 4ac$

Putting the value of $a = (4-k)$, $b = (2k+4)$ and $c = (8k+1)$

$$\begin{aligned} &= (2k+4)^2 - 4 \times (4-k) \times (8k+1) \\ &= 4k^2 + 16k + 16 - 4(4 + 31k - 8k^2) \\ &= 4k^2 + 16k + 16 - 16 - 124k + 32k^2 \\ &= 36k^2 - 108k + 0 \\ &= 36k^2 - 108k \end{aligned}$$

The given equation will have real and equal roots, if $D = 0$

Thus,

$$36k^2 - 108k = 0$$

$$18k(2k - 6) = 0$$

$$k(2k - 6) = 0$$

Now factorizing of the above equation

$$k(2k - 6) = 0$$

So, either

$$k = 0$$

or

$$(2k - 6) = 0$$

$$2k = 6$$

$$k = \frac{6}{2}$$

$$= 3$$

Therefore, the value of $k = \boxed{0, 3}$

Quadratic Equations Ex 8.6 Q5

Answer :

The given quadric equation is $x^2 + kx + 4 = 0$, and roots are real.

Then find the value of k .

Here,

$$a = 1, b = k \text{ and } c = 4$$

As we know that $D = b^2 - 4ac$

Putting the value of $a = 1, b = k$ and $c = 4$

$$= (k)^2 - 4 \times 1 \times 4$$

$$= k^2 - 16$$

The given equation will have real and equal roots, if $D = 0$

$$k^2 - 16 = 0$$

Now factorizing of the above equation

$$k^2 - 16 = 0$$

$$k^2 = 16$$

$$k = \sqrt{16}$$

$$= \pm 4$$

Now according to question, the value of k is positive.

Therefore, the value of $k = \boxed{4}$

Quadratic Equations Ex 8.6 Q6

Answer :

(i) The given quadric equation is $kx^2 + 2x + 1 = 0$, and roots are real and distinct

Then find the value of k .

Here,

$$a = k, b = 2 \text{ and } c = 1$$

As we know that $D = b^2 - 4ac$

Putting the value of $a = k, b = 2$ and $c = 1$

$$D = (2)^2 - 4 \times k \times 1$$

$$= 4 - 4k$$

The given equation will have real and distinct roots, if $D > 0$

$$4 - 4k > 0$$

Now factorizing of the above equation

$$4 - 4k > 0$$

$$4k < 4$$

$$k < \frac{4}{4}$$

$$< 1$$

Now according to question, the value of k less than 1

Therefore, the value of $k = \boxed{k < 1}$

(ii) The given quadric equation is $kx^2 + 6x + 1 = 0$, and roots are real and distinct.
Then find the value of k .

Here,

$$a = k, b = 6 \text{ and } c = 1$$

As we know that $D = b^2 - 4ac$

Putting the value of $a = k, b = 6$ and $c = 1$

$$\begin{aligned} D &= (6)^2 - 4 \times k \times 1 \\ &= 36 - 4k \end{aligned}$$

The given equation will have real and distinct roots, if $D > 0$

$$36 - 4k > 0$$

Now factorizing of the above equation

$$36 - 4k > 0$$

$$4k < 36$$

$$\begin{aligned} k &< \frac{36}{4} \\ &< 9 \end{aligned}$$

Now according to question, the value of k less than 9

Therefore, the value of $k < 9$

(iii) The given quadric equation is $x^2 - kx + 9 = 0$, and roots are real and distinct
Then find the value of k .

Here,

$$a = 1, b = k \text{ and } c = 9$$

As we know that $D = b^2 - 4ac$

Putting the value of $a = 1, b = k$ and $c = 9$

$$\begin{aligned} D &= (k)^2 - 4 \times 1 \times 9 \\ &= k^2 - 36 \end{aligned}$$

The given equation will have real and distinct roots, if $D > 0$

$$k^2 - 36 > 0$$

Now factorizing of the above equation

$$k^2 - 36 > 0$$

$$k^2 > 36$$

$$k > \sqrt{36} = \pm 6$$

$$k < -6 \text{ or } k > 6$$

Therefore, the value of $k < -6$ or $k > 6$

***** END *****