



Quadratic Equations Ex 8.6 Q1

Answer :

(i) The given quadric equation is $2x^2 - 3x + 5 = 0$

Here, $a = 2, b = -3$ and, $c = 5$

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

Putting the value of $a = 2, b = -3$ and, $c = 5$

$$= (-3)^2 - 4 \times 2 \times 5$$

$$= 9 - 40$$

$$= -31$$

Since, $D < 0$

Therefore, root of the given equation are **not real**.

(ii) The given quadric equation is $2x^2 - 6x + 3 = 0$

Here, $a = 2, b = -6$ and, $c = 3$

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

Putting the value of $a = 2, b = -6$ and, $c = 3$

$$= (-6)^2 - 4 \times 2 \times 3$$

$$= 36 - 24$$

$$= 12$$

Since, $D > 0$

Therefore, root of the given equation are **real and distinct**.

(iii) The given quadric equation is $\frac{3}{5}x^2 - \frac{2}{3}x + 1 = 0$

$$\Rightarrow 9x^2 - 10x + 15 = 0$$

Here, $a = 9, b = -10$ and, $c = 15$

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

Putting the value of $a = 9, b = -10$ and, $c = 15$

$$= (-10)^2 - 4 \times 9 \times 15$$

$$= 100 - 540$$

$$= -440$$

Since, $D < 0$

Therefore, root of the given equation are **not real**.

(iv) The given quadric equation is $3x^2 - 4\sqrt{3}x + 4 = 0$

Here, $a = 3, b = -4\sqrt{3}$ and, $c = 4$

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

Putting the value of $a = 3, b = -4\sqrt{3}$ and, $c = 4$

$$= (-4\sqrt{3})^2 - 4 \times 3 \times 4$$

$$= 48 - 48$$

$$= 0$$

Since, $D = 0$

Therefore, root of the given equation are **real and equal**.

(v) The given quadric equation is $3x^2 - 2\sqrt{6}x + 2 = 0$

Here, $a = 3$, $b = -2\sqrt{6}$ and, $c = 2$

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

Putting the value of $a = 3$, $b = -2\sqrt{6}$ and, $c = 2$

$$= (-2\sqrt{6})^2 - 4 \times 3 \times 2$$

$$= 24 - 24$$

$$= 0$$

Since, $D = 0$

Therefore, root of the given equation are **real and equal**.

(vi) The given quadric equation is $(x - 2a)(x - 2b) = 4ab$

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

$$\Rightarrow x^2 - 2(a + b)x = 0$$

Here, $a = 1$, $b = -2(a + b)$ and, $c = 0$

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

Putting the value of $a = 1$, $b = -2(a + b)$ and, $c = 0$

$$= (-2(a + b))^2 - 4 \times 1 \times 0$$

$$= 4(a^2 + 2ab + b^2) - 0$$

$$= 4a^2 + 8ab + 4b^2$$

Since, $D > 0$

Therefore, root of the given equation are **real and distinct**.

(vii) The given quadric equation is $9a^2b^2x^2 - 24abcdx + 16c^2d^2 = 0$

Here, $a = 9a^2b^2$, $b = -24abcd$ and, $c = 16c^2d^2$

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

Putting the value of $a = 9a^2b^2$, $b = -24abcd$ and, $c = 16c^2d^2$

$$= (24abcd)^2 - 4 \times 9a^2b^2 \times 16c^2d^2$$

$$= (576a^2b^2c^2d^2) - 576a^2b^2c^2d^2$$

$$= 0$$

Since, $D = 0$

Therefore, root of the given equation are **real and equal**.

(viii) The given quadric equation is $2(a^2 + b^2)x^2 + 2(a + b)x + 1 = 0$

Here, $a = 2(a^2 + b^2)$, $b = 2(a + b)$ and, $c = 1$

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

Putting the value of $a = 2(a^2 + b^2)$, $b = 2(a + b)$ and, $c = 1$

$$= (2(a + b))^2 - 4 \times 2(a^2 + b^2) \times 1$$

$$= (4a^2 + 4b^2 + 8ab) - 8a^2 - 8b^2$$

$$= 8ab - 4a^2 - 4b^2$$

Since, $D < 0$

Therefore, root of the given equation are **not real**.

(ix) The given quadric equation is $(b+c)x^2 - (a+b+c)x + a = 0$

Here, $a = (b+c)$, $b = -(a+b+c)$ and, $c = a$

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

Putting the value of $a = (b+c)$, $b = -(a+b+c)$ and, $c = a$

$$= \left(-(a+b+c) \right)^2 - 4 \times (b+c) \times a$$

$$= \left(a^2 + b^2 + c^2 + 2ab + 2bc + 2ca \right) - 4ab - 4ca$$

$$= a^2 + b^2 + c^2 - 2ab + 2bc - 2ca$$

Since, $D > 0$

Therefore, root of the given equation are real and unequal .

***** END *****