Quadratic Equations Ex 8.6 Q1

Answer :

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

Here, $a=2,b=-3\text{and},c=5$

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

Putting the value of $a=2,b=-3\text{and},c=5$

$=(-3)^2-4\times2\times5$

$=9-40$

$=-31$

Since, $D<0$

Therefore, root of the given equation are $\boxed{\text{not real}}$.

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

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

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

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

$=(-6)^2-4\times2\times3$

$=36-24$

$=12$

Since, $D>0$

Therefore, root of the given equation are $\boxed{\text{real and distinct}}$.

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

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

Here, $a=9, b=-10 \text{ and}, c=15$

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

Putting the value of $a=9, b=-10 \text{ and}, c=15$

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

$=100-540$

$=-440$

Since, $D<0$

Therefore, root of the given equation are $\boxed{\text{not real}}$.

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

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

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

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

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

$=48-48$

$=0$

Since, $D=0$

Therefore, root of the given equation are $\boxed{\text{real and equal}}$.

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

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

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

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

$$=\left(-2\sqrt{6}\right)^2-4\times3\times2$$

$$=24-24$$

$$=0$$

Since, $D=0$

Therefore, root of the given equation are $\boxed{\text{real and equal}}$.

(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, $a=1,\ b=-2(a+b)\text{and},c=0$

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

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

$$=\left(-2(a+b)\right)^2-4\times1\times0$$

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

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

Since, $D>0$

Therefore, root of the given equation are $\boxed{\text{real and distinct}}$.

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

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

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

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

$$=\left(24abcd\right)^2-4\times9a^2b^2\times16c^2d^2$$

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

$$=0$$

Since, $D=0$

Therefore, root of the given equation are $\boxed{\text{real and equal}}$.

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

Here, $a=2(a^2+b^2),\ b=2(a+b)\text{and},c=1$

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

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

$$=\left(2(a+b)\right)^2-4\times2(a^2+b^2)\times1$$

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

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

Since, $D<0$

Therefore, root of the given equation are $\boxed{\text{not real}}$.

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

Here, $a=(b+c),\ b=-(a+b+c)\text{ and},c=a$

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

Putting the value of $a=(b+c),\ b=-(a+b+c)\text{ and},c=a$

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

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

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

Since, $D>0$

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

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