



Exercise 10C

Question 1:

$$x^2 + 8x + 16 = 0$$

The given equation is

This is of the form $ax^2+bx+c=0$, we get

$$a = 1, b = 8, c = 16$$

$$\therefore D = b^2 - 4ac = [(8)^2 - 4 \times 1 \times 16] = (64 - 64) = 0$$

So the given equation has real and equal roots

Question 2:

$$x^2 - 6x + 6 = 0$$

The given equation is

This is of the form $ax^2+bx+c=0$, we get

$$a = 1, b = -6, c = 6$$

$$\therefore D = b^2 - 4ac = [(-6)^2 - 4 \times 1 \times 6] = 36 - 24 = 12$$

So the given equation has real and equal roots

Question 3:

$$9x^2 - 12x + 4 = 0$$

The given equation is

This is of the form $ax^2+bx+c=0$, we get

$$a = 9, b = -12, c = 4$$

$$\therefore D = b^2 - 4ac = [(-12)^2 - 4 \times 9 \times 4] = 144 - 144 = 0$$

So the given equation has real and equal roots

Question 4:

$$9x^2 - 6x + 4 = 0$$

The given equation is

This is of the form $ax^2+bx+c=0$, we get

$$a = 9, b = -6, c = 4$$

$$\therefore D = b^2 - 4ac = [(-6)^2 - 4 \times 9 \times 4] = 36 - 144 < 0$$

So the given equation has real and equal roots

Question 5:

$$3x^2 - 2\sqrt{6}x + 2 = 0$$

The given equation is

This is the form $ax^2 + bx + c = 0$, we get

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

$$\therefore D = b^2 - 4ac = \left[(-2\sqrt{6})^2 - 4 \times 3 \times 2\right] = 24 - 24 = 0$$

So the given equation has real and equal roots

Question 6:

The given equation is $12x^2 - 4\sqrt{15}x + 5 = 0$

This is of the form $ax^2 + bx + c = 0$, we get

Here $a = 12$, $b = -4\sqrt{15}$, $c = 5$

$$\therefore D = b^2 - 4ac = \left[(-4\sqrt{15})^2 - 4 \times 12 \times 5\right] = 240 - 240 = 0$$

So the given equation has real and equal roots

Question 7:

$$x^2 + px - q^2 = 0$$

The given equation is

This is the form of $ax^2 + bx + c = 0$

$$a = 1, b = p, c = -q^2$$

$$\therefore D = b^2 - 4ac = (p)^2 - 4 \times 1 \times (-q^2) = p^2 + 4q^2 \geq 0$$

Now $D \geq 0$

So, the roots of the given equation are real for all real value of p and q .

Question 8:

$$x^2 + ax - 1 = 0$$

The given equation is

$$a = 1, b = a, c = -1$$

$$\therefore D = b^2 - 4ac = (a)^2 - 4 \times 1 \times (-1) = a^2 + 4 > 0$$

So, the roots of the given equation are real and distinct for all real values of a .

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