MISCELLANEOUS EXERCISE – 2

Q.1 Multiply Choice Questions.
Four possible answers are given for the following questions. Tick (✓) the correct answer.

1. $\frac{1}{\alpha}+\frac{1}{\beta}$ is equal to
   (a) $\frac{1}{\alpha}$ (b) $\frac{1}{\alpha}-\frac{1}{\beta}$
   (c) $\frac{\alpha-\beta}{\alpha\beta}$ (d) $\frac{\alpha+\beta}{\alpha\beta}$

2. Product of cube roots of unity is
   (a) 0 (b) 1
   (c) -1 (d) 3

3. Roots of the equation $4x^2-5x+2=0$ are
   (a) irrational (b) imaginary
   (c) rational (d) none of these

4. Two square roots of unity are
   (a) $1,-1$ (b) $1,\omega$
   (c) $1,-\omega$ (d) ω,ω^2

5. Roots of the equation $4x^2-4x+1=0$ are
   (a) real, equal (b) real, unequal
   (c) imaginary (d) irrational

6. If α,β are the roots of $7x^2-x+4=0$ then $\alpha\beta$ is.........
   (a) $\frac{-1}{7}$ (b) $\frac{4}{7}$
   (c) $\frac{7}{4}$ (d) $\frac{-4}{7}$

7. If $b^2-4ac<0$ then the roots of $ax^2+bx+c=0$ are
   (a) irrational (b) rational
   (c) imaginary (d) None of these

8. If α,β are the roots of $px^2+qx+r=0$, then sum of the roots 2α and 2β is
   (a) $\frac{-q}{p}$ (b) $\frac{r}{p}$
   (c) $\frac{-2q}{p}$ (d) $-\frac{q}{2p}$

9. If α,β are the roots of $3x^2+5x-2=0$ then $\alpha+\beta$ is......
   (a) $\frac{5}{3}$ (b) $\frac{3}{5}$
   (c) $\frac{-5}{3}$ (d) $\frac{-2}{3}$

10. If $b^2-4ac>0$ and is a perfect square, then roots of $ax^2+bx+c=0$ are
    (a) irrational, equal
    (b) rational, equal
    (c) rational, unequal
    (d) irrational, unequal

11. Cube roots of -1 are
    (a) $-1,-\omega,-\omega^2$ (b) $-1,\omega,-\omega^2$
    (c) $-1,-\omega,\omega^2$ (d) $1,-\omega,-\omega^2$

12. Sum of the cube roots of unity is
    (a) 0 (b) 1
    (c) -1 (d) 3

13. If $b^2 - 4ac > 0$, but not a perfect square then roots of $ax^2+bx+c=0$ are
(a) imaginary (b) rational
(c) irrational (d) None of these

14. If α, β are the roots of $x^2-x-1=0$, then product of the roots 2α and 2β is
(a) –2 (b) 2
(c) 4 (d) – 4

15. Disc. of $x^2 - 3x + 3 = 0$ is ......
(a) 6 (b) 12
(c) 21 (d) –3

16. The discriminant of $ax^2+bx+c=0$ is
(a) b^2-4ac (b) b^2+4ac
(c) $-b^2+4ac$ (d) $-b^2-4ac$

17. $\alpha^2 + \beta^2$ is equal to
(a) $\alpha^2 - \beta^2$ (b) $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$
(c) $(\alpha + \beta)^2 - 2\alpha\beta$ (d) $\alpha + \beta$

18. If roots of a quadratic equation are irrational and distinct, then Disc. is.......
(a) perfect square
(b) not perfect square
(c) zero
(d) negative

19. Disc. of $2x^2 - 7x + 1 = 0$ is .....
(a) 47 (b) 41
(c) 40 (d) 51

20. The nature of the roots of equation $ax^2+bx+c = 0$ is determined by.
(a) Sum of the roots
(b) Product of the roots
(c) Synthetic division
(d) Discriminant

21. If for a quadratic equation $b^2 - 4ac = 205$, then roots are...
(a) complex (b) irrational
(c) rational (d) equal

22. If roots of a quadratic equation are equal, then Disc. is............
(a) positive (b) negative
(c) zero (d) irrational

23. If roots of a quadratic equation are real, rational and unequal then possible value of Disc. is...........
(a) 0 (b) 36
(c) 40 (d) –25

24. If roots of an quadratic equation are real and distinct then Disc. is ....
(a) positive (b) negative
(c) zero (d) imaginary

25. If ω and ω^2 are complex cube root of unity, then $\omega.\omega^2$=..........
(a) 1 (b) –1
(c) 0 (d) 2

26. If $b^2 - 4ac = 0$, then roots of $ax^2 + bx + c = 0$ are
(a) irrational, equal
(b) rational, equal
(c) rational, unequal
(d) irrational, unequal

27. If for a quadratic equation $b^2 - 4ac = 49$, then roots are real and ....
(a) equal (b) unequal
(c) irrational (d) imaginary

28. If roots of a quadratic equation are imaginary, and unequal, the possible value of Disc. is..........
(a) 0 (b) 9
(c) 8 (d) –9

29. If for a quadratic equation $b^2 - 4ac = 0$, then roots are .
(a) complex (b) irrational
(c) repeated (d) distinct

30. The roots of $x^2 + 8x + 16 = 0$ are...
(a) imaginary (b) equal
(c) unequal (d) irrational

31. If $\omega = \frac{-1-\sqrt{-3}}{2}$, then ω^2=.....
(a) $\frac{-1\pm\sqrt{3}}{2}$ (b) $\frac{-1+\sqrt{3}}{2}$
(c) $\frac{-1+\sqrt{-3}}{2}$ (d) $\frac{-1\pm\sqrt{-3}}{2}$

32. If 1, ω, ω^2 are cube root of unity, then $1+\omega+\omega^2 =$ ....
(a) 0 (b) ω^3
(c) 1 (d) −1

33. If roots of a quadratic equation are imaginary, then Disc. is......
(a) positive (b) negative
(c) zero (d) irrational

34. Cube root of 64 are.............
(a) $-4,-4\omega,-4\omega^2$ (b) $4,16\omega$
(c) $4,4\omega,4\omega^2$ (d) $(4)^3$

35. If for a quadratic equation $b^2-4ac=-47$, then roots are.....
(a) real (b) rational
(c) irrational (d) complex

36. Which of the following is true description of nature of roots of a quadratic equation?
(a) real, irrational, equal
(b) real, imaginary, unequal
(c) real, irrational, unequal
(d) complex, repeated, rational

37. If roots of a quadratic equation are rational and distinct, then Disc. is.......
(a) perfect square
(b) not perfect square
(c) zero
(d) negative

38. If ω is complex cube root of unity, then $\omega^{63} =$ ....
(a) ω (b) 1
(c) −ω (d) $-\omega^2$

39. If roots of a quadratic equation are real, rational and equal, then possible value of Disc. is............
(a) 0 (b) 36
(c) 40 (d) −49

40. If ω is complex cube root of unity, then $\omega^{-16} =$ ....
(a) ω (b) −ω
(c) $-\omega^2$ (d) ω^2

41. $\left(-1+\sqrt{-3}\right)^3 =$................
(a) 8 (b) 1
(c) −4 (d) −28

42. Cube roots of −27 are...........
(a) $3,-3\omega,3\omega^2$
(b) $-3,-3\omega,-3\omega^2$
(c) $-3,3\omega,3\omega^2$
(d) $3,3\omega,-3\omega^2$

43. If ω is complex cube root of unity, then $\omega^{-27} =$ ....
(a) 1 (b) −1
(c) ω (d) ω^2

44. $\left(9+4\omega+4\omega^2\right)^3 =$ ....
(a) 15 (b) 25
(c) 125 (d) $(17)^3$

45. $\omega^4 =$................
(a) ω^2 (b) ω
(c) 1 (d) 0

46. Which of the following shows "the product of two consecutive positive numbers."
(a) $x(x+1)$ (b) $x(x+2)$
(c) $x(x+3)$ (d) $x(x+4)$

47. If 1, ω, ω^2 are cube root of unity, then $1+\omega =$ ....
(a) 0 (b) ω
(c) ω^2 (d) $-\omega^2$

48. If ω is complex cube root of unity, then $\omega^7 =$ ....
(a) ω (b) −ω
(c) ω^2 (d) $-\omega^2$

49. If 1, ω, ω^2 are cube root of unity, then $1+\omega^2 =$ ....
(a) −ω (b) ω
(c) ω^2 (d) $-\omega^2$

50. "Five less than three times a certain number" is
(a) $3x-5$ (b) $3x+5$
(c) $5x+3$ (d) $5x-3$

51. If 1, ω, ω^2 are cube root of unity, then $\omega+\omega^2 =$ ....
(a) 1 (b) −1
(c) ω^3 (d) $2\omega^2$

52. If roots of a quadratic equation are real, irrational and unequal then possible value of Disc. is............

(a) 0 (b) 9
(c) 5 (d) −7

53. $\left(1-\omega-\omega^2\right)^5 =$ ....

(a) 6 (b) 16
(c) 32 (d) 64

54. If length and width of a rectangle are x and y respectively then which of the following shows perimeter?

(a) $(x+y)^2$ (b) $2x-2y$
(c) $2xy$ (d) $2(x+y)$

55. If ω is complex cube root of unity, then $\omega^{23} =$ ....

(a) ω (b) $-\omega$
(c) ω^2 (d) $-\omega^2$

56. Which of the following are symmetric functions of the roots of a quadratic equation?

(a) $\alpha^2+\beta^2$ (b) $\alpha^3+\beta^3$
(c) $\frac{1}{\alpha}+\frac{1}{\beta}$ (d) all of these

57. If ω is complex cube root of unity, then $\omega^{-5} =$ ....

(a) ω (b) 1
(c) $-\omega$ (d) $-\omega^2$

58. The equation $x^4-49x^2+36x+252=0$ is called .... equation.

(a) quadratic (b) quartic
(c) linear (d) cubic

59. $\left(1-3\omega-3\omega^2\right)^3 =$.................

(a) 12 (b) 16
(c) −125 (d) 64

60. Cube roots of 8 are.............

(a) $2,\ 2\omega,\ 2\omega^2$
(b) $-2, -2\omega, -2\omega^2$
(c) $2, -2\omega, -2\omega^2$
(d) $2, -2\omega, 2\omega^2$

61. The sum of five times a number and the square of the number is ......

(a) $5x^2+x$ (b) $5x+x^2$
(c) $(5x+x)^2$ (d) $5\left(x+x^2\right)$

ANSWER KEY

1.	d	2.	b	3.	b	4.	a	5.	a
6.	b	7.	c	8.	c	9.	c	10.	c
11.	a	12.	a	13.	c	14.	d	15.	d
16.	a	17.	c	18.	b	19.	b	20.	d
21.	b	22.	c	23.	b	24.	a	25.	a
26.	b	27.	b	28.	d	29.	c	30.	b
31.	c	32.	a	33.	b	34.	c	35.	d
36.	c	37.	a	38.	b	39.	a	40.	d
41.	a	42.	b	43.	a	44.	c	45.	b
46.	a	47.	d	48.	a	49.	a	50.	a
51.	b	52.	c	53.	c	54.	d	55.	c
56.	d	57.	a	58.	b	59.	d	60.	a
61.	b								

Q.2. Write short answers of the following questions.

(i) Discuss the nature of roots of the following equations.

(a) $x^2+3x+5=0$

Solution:

$x^2+3x+5=0$

$ax^2+bx+c=0$

⇒ a=1, b=3, c=5

Disc. $= b^2-4ac$

$= (3)^2-4\,(1)\,(5)$

$=9-20$

$=-11<0$

So roots of equation are imaginary

(b) $2x^2-7x+3=0$

Solution:

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

$ax^2+bx+c=0$

⇒ a=2 , b = −7 , c=3

Disc. $= b^2-4ac$

$= (-7)^2 - 4\,(2)\,(3)$
$= 49-24$
$= 25$
$= (5)^2 > 0$

As Disc. is positive and perfect square so roots of equation are real, rational and distinct.

(c) $\mathbf{x^2 + 6x - 1 = 0}$

Solution:

$x^2 + 6x - 1 = 0$
$ax^2 + bx + c = 0$

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

Disc. $= b^2 - 4ac$
$= (6)^2 - 4(1)(-1)$
$= 36 + 4$
$= 40 > 0$

As Disc. is positive and not perfect square, so roots of equations are real, irrational and unequal.

(d) $\mathbf{16x^2 - 8x + 1 = 0}$

Solution: $16x^2 - 8x + 1 = 0$

$ax^2 + bx + c = 0$

$\Rightarrow$ $a = 16$, $b = -8$, $c = 1$

Disc. $= b^2 - 4ac$
$= (-8)^2 - 4\,(16)\,(1)$
$= 64-64$
$= 0$

So roots of equation are real rational and equal.

(ii) Find ω^2, if $\omega = \dfrac{-1+\sqrt{-3}}{2}$

Solution: $\omega = \dfrac{-1+\sqrt{-3}}{2}$

Taking square of both sides, we get

$$\omega^2 = \left(\frac{-1+\sqrt{-3}}{2}\right)^2$$

$$\omega^2 = \frac{\left(-1+\sqrt{-3}\right)^2}{(2)^2}$$

$$\omega^2 = \frac{(-1)^2 + \left(\sqrt{-3}\right)^2 + 2(-1)\sqrt{-3})}{4}$$

$$\omega^2 = \frac{1+(-3)-2\sqrt{-3}}{4}$$

$$\omega^2 = \frac{-2-2\sqrt{-3}}{4}$$

$$\omega^2 = \frac{\cancel{2}(-1-\sqrt{-3})}{\cancel{4}\,2}$$

$$\omega^2 = \frac{-1-\sqrt{-3}}{2}$$

(iii) Prove that the sum of all the cube roots of unity is zero.

Solution: We have cube roots of unity

$$1,\ \omega = \frac{-1+\sqrt{3}}{2}\ ,\ \omega^2 = \frac{-1-\sqrt{-3}}{2}$$

Taking sum, we get

$$1+\omega+\omega^2 = 1 + \frac{\left(-1+\sqrt{-3}\right)}{2} + \frac{\left(-1-\sqrt{-3}\right)}{2}$$

$$1+\omega+\omega^2 = 1 + \frac{(-1+\sqrt{-3})+(-1-\sqrt{-3})}{2}$$

$$1+\omega+\omega^2 = \frac{2+(-1+\cancel{\sqrt{-3}}-1-\cancel{\sqrt{-3}})}{2}$$

$$1+\omega+\omega^2 = \frac{2-2}{2}$$

$$1+\omega+\omega^2 = \frac{0}{2}$$

$$1+\omega+\omega^2 = 0$$

It is proved that sum of all the cube roots of unity is zero.

(iv) Find the product of complex cube roots of unity.

Solution: Following are the complex cube roots of unity

$$\omega = \frac{-1+\sqrt{-3}}{2}\quad \omega^2 = \frac{-1-\sqrt{-3}}{2}$$

Taking product, we get

$$\omega.\omega^2 = \left(\frac{-1+\sqrt{-3}}{2}\right)\left(\frac{-1-\sqrt{-3}}{2}\right)$$

$$\omega^3 = \frac{(-1)^2-(\sqrt{-3})^2}{4} \qquad \boxed{\because (a+b)(a-b) = a^2-b^2}$$

$$\omega^3 = \frac{1-(-3)}{4}$$

$\omega^3 = \frac{1+3}{4}$

$\omega^3 = \frac{4}{4}$

$\omega^3 = 1$

Product of complex cube roots of unity is 1.

(v) Show that $x^3+y^3 = (x + y)(x + \omega y)(x + \omega^2 y)$

Solution: Let

R.H.S. $= (x + y)\,(x + \omega y)\,(x + \omega^2 y)$

$= (x+y)\,[x^2+\omega^2 xy+\omega xy+\omega^3 y^2]$

$= (x+y)\,[x^2 + xy\,(\omega^2 +\omega)\,(1)y^2]$ $\boxed{\because \omega^3 = 1}$

$= (x + y)\,[x + xy(-1) + y^2]$ $\boxed{\because \omega+\omega^2 = -1}$

$= (x + y)\,(x^2 - xy + y^2)$

$= x^3 + y^3 =$ L.H.S.

(vi) Evaluate $\omega^{37} + \omega^{38} + 1$

Solution:

$\omega^{37} + \omega^{38} + 1 = \omega.\omega^{36} + \omega^2.\omega^{36} + 1$

$= \omega\,(\omega^3)^{12} + \omega^2\,(\omega^3)^{12} + 1$

$= \omega\,(1)^{12} + \omega^2\,(1)^{12} + 1$

$= \omega + \omega^2 + 1$ $(\because \omega^3 = 1)$

$= 0$ $(\because 1 + \omega + \omega^2 = 0)$

(vii) Evaluate $(1 - \omega + \omega^2)^6$

Solution:

$(1 + \omega^2 - \omega)^6 = (-\omega - \omega)^6$ $(\because \omega^2 = -\omega)$

$= (-2\omega)^6$

$= (-2)^6\,(\omega)^6$

$= 64\omega^6$

$= 64(\omega^3)^2$ $(\because \omega^3 = 1)$

$= 64(1)^2$

$= 64(1)$

$= 64$

(viii) If ω is cube root of unity, form an equation whose roots are 3ω and $3\omega^2$.

Solution:

Since 3ω and $3\omega^2$ are the roots of the required equation.

Sum of roots

$S = 3\omega + 3\omega^2$

$S = 3(\omega + \omega^2)$

$S = 3(-1)$

$S = -3$

Product of roots

$P = (3\omega)\,(3\omega^2)$

$P = 9\omega^3$

$P = 9(1)$ $(\because \omega^3 = 1)$

$P = 9$

Hence the required equation is

$x^2 - Sx + P = 0$

$x^2 - (-3)\,x + 9 = 0$

$x^2 + 3x + 9 = 0$

(ix) Using synthetic division, find the remainder and quotient when

$(x^3 + 3x^2 + 2) \div (x - 2)$

Solution: As $x - 2 = 0 \Rightarrow x = 2$

Now write the coefficients of dividend in a row and x = 2 on the left side.

	1	3	0	2
2	↓	2	10	20
	1	5	10	22

Quotient $Q(x) = (x^2 + 5x + 10)$

Remainder $= 22$

(x) Using synthetic division, show that x–2 is the factor of x^3+x^2-7x+2.

Solution: Write the coefficients of dividend in a row and x = 2 on the left side.

$x^2 + x^2 - 7x + 2$

2	1	1	– 7	2
	↓	2	6	– 2
	1	3	– 1	0

As remainder is zero, so by synthetic division $x - 2$ is factor of $x^3 + x^2 - 7x + 2$

(xi) Find the sum and product of the roots of the equation $2px^2+3qx-4r = 0$

Solution: $2px^2 + 3qx - 4r = 0$

$ax^2 + bx + c= 0$

$a = 2p$, $b = 3q$, $c = -4r$

Sum of roots $= S = \frac{-b}{a} = \frac{-3q}{2p}$

Product of roots $= P = \frac{c}{a} = \frac{-4r}{2p}$

$P = \frac{-2r}{p}$

(xii) Find $\frac{1}{\alpha^2}+\frac{1}{\beta^2}$ of the roots of the equation $x^2-4x+3=0$

Solution: $x^2-4x+3=0$

$ax^2+bx+c=0$

$\Rightarrow$ $a=1$, $b=-4$, $c=3$

If α and β are roots of the given equation then

Sum of roots $=\alpha+\beta=\frac{-b}{a}=\frac{-(-4)}{1}=4$

Product of roots $=\alpha\beta=\frac{c}{a}=\frac{3}{1}=3$

Given that $\frac{1}{\alpha^2}+\frac{1}{\beta^2}=\frac{\beta^2+\alpha^2}{\beta^2\alpha^2}$

$=\frac{\alpha^2+\beta^2}{(\alpha\beta)^2}$

$=\frac{(\alpha+\beta)^2-2\alpha\beta}{(\alpha\beta)^2}$

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

$=\frac{16-6}{9}$

$=\frac{10}{9}$

(xiii) If α, β are the roots of $4x^2-3x+6=0$ find

(a) $\alpha^2+\beta^2$ **(b)** $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$ **(c)** $\alpha-\beta$

Solution:

$4x^2-3x+6=0$

$ax^2+bx+c=0$

$\Rightarrow$ $a=4$, $b=-3$, $c=6$

As α and β are roots of the equation

Sum of roots $=\alpha+\beta=\frac{-b}{a}=\frac{-(-3)}{4}=\frac{3}{4}$

Product of roots $=\alpha\beta=\frac{c}{a}=\frac{6}{4}=\frac{3}{2}$

Now

(a) $\alpha^2+\beta^2$

$\alpha^2+\beta^2=(\alpha+\beta)^2-2(\alpha\beta)$

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

$=\frac{9}{16}-3$

$=\frac{9-48}{16}$

$=\frac{-39}{16}$

(b) $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$

$\frac{\alpha}{\beta}+\frac{\beta}{\alpha}=\frac{\alpha^2+\beta^2}{\alpha\beta}$

$=\frac{(\alpha+\beta)^2-2\alpha\beta}{\alpha\beta}$

$=\left[(a+b)^2-2ab\right]\div\alpha\beta$

$=\left[\left(\frac{3}{4}\right)^2-2\left(\frac{3}{2}\right)\right]\div\frac{3}{2}$

$=\left(\frac{9}{16}-3\right)\times\frac{2}{3}$

$=\left(\frac{9-48}{16}\right)\times\frac{2}{3}$

$=\frac{-39}{16}\times\frac{2}{3}$

$=\frac{-13}{8}$

(c) $\alpha-\beta$

$(\alpha-\beta)^2=\alpha^2+\beta^2-2\alpha\beta$

$\sqrt{(\alpha-\beta)^2}=\sqrt{\alpha^2+\beta^2-2\alpha\beta}$

$\alpha-\beta=\sqrt{\alpha^2+\beta^2+2\alpha\beta-2\alpha\beta-2\alpha\beta}$

$\alpha-\beta=\sqrt{(\alpha+\beta)^2-4\alpha\beta}$

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

$= \sqrt{\frac{9}{16} - 6}$

$= \sqrt{\frac{9-96}{16}}$

$= \sqrt{\frac{-87}{16}}$

$= \frac{\sqrt{-87}}{4}$

(xiv) If α, β are the roots of $x^2 - 5x + 7 = 0$, find an equation whose roots are

(a) $-\alpha, -\beta$ (b) $2\alpha, 2\beta$

Solution: $x^2 - 5x + 7 = 0$

$ax^2 + bx + c = 0$

$\Rightarrow a = 1, b = -5, c = 7$

Sum of roots $= S = \frac{-b}{a} = \frac{-(-5)}{1} = 5$

Product of roots $= P = \alpha\beta = \frac{c}{a} = \frac{7}{1} = 7$

Now if roots are $-\alpha, -\beta$

(a) Equation with the roots $-\alpha, -\beta$

Sum of roots $= S = (-\alpha) + (-\beta)$

$S = -(\alpha + \beta)$

$S = -(+5)$

$S = -5$

Product of roots $= P = (-\alpha)(-\beta)$

$P = \alpha\beta$

$P = 7$

So required equation

$x^2 - Sx + P = 0$

$x^2 - (-5)x + 7 = 0$

$x^2 + 5x + 7 = 0$

(b) The equation with the roots $2\alpha, 2\beta$

Sum of roots $= S = 2\alpha + 2\beta$

$= 2(\alpha + \beta)$

$= 2(5)$

$= 10$

Product of roots $= P = 2\alpha \times 2\beta$

$= 4\alpha\beta$

$= 4(7)$

$= 28$

So required equation is:

$x^2 - Sx + P = 0$

$x^2 - 10x + 28 = 0$

Q.3:Fill in the blanks

i. The discriminant of $ax^2+bx+c= 0$ is ______.

ii. If $b^2-4ac=0$ then roots of $ax^2+bx+c= 0$ are__________.

iii. If $b^2-4ac > 0$ then roots of $ax^2+bx+c= 0$ are__________.

iv. If $b^2-4ac<0$ then the root of $ax^2+bx+c= 0$ are_________.

v. If $b^2-4ac>0$ and perfect square, then roots of $ax^2+bx+c= 0$ are_________.

vi. If $b^2-4ac>0$ and not perfect square, then roots of $ax^2+bx+c= 0$ are_________.

vii. If α, β are the roots of $ax^2+bx+c=0$, then sum of the roots is__________.

viii. If α, β are the roots of $ax^2+bx+c=0$, then product of the roots is__________.

ix. If α, β are the roots of $7x^2-5x+3=0$, then sum of the roots is__________.

x. If α, β are the roots of $5x^2+3x-9=0$, then product of the roots is__________.

xi. For a quadratic equation $ax^2+bx+c = 0$ $\frac{1}{\alpha\beta}$ is equal to__________.

xii. Cube roots of unity are __________.

xiii. Under usual notation sum of the cube roots of unity is__________.

xiv. If $1, \omega, \omega^2$ are the cube roots of unity, then ω^{-7} is equal to _________.

xv. If α, β are the roots of the quadratic equation, then the quadratic equation is written as ____________.

xvi. If 2ω and $2\omega^2$ are the roots of an equation, then equation is_________.

ANSWER

i.	b^2-4ac	**ix.**	$\frac{5}{7}$
ii.	Equal	**x.**	$-\frac{9}{5}$
iii.	Real	**xi.**	$\frac{a}{c}$
iv.	Imaginary	**xii.**	$1,\omega,\omega^2$
v.	Rational	**xiii.**	Zero
vi.	Irrational	**xiv.**	ω^2
vii.	$-\frac{b}{a}$	**xv.**	$x^2-(\alpha+\beta)x+\alpha\beta=0$
viii.	$\frac{c}{a}$	**xvi.**	$x^2+2x+4=0$