doubtnut
India's Number 1 Education App

MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

QUADRATIC EQUATIONS AND EXPRESSION

Question Bank

1. If m and n are the roots of the quadratic equations $x^2 - 6x + 2 = 0$, then the value of $(m + n)^2$ is

A. 0

B. a

C. -a

D. $\pm m^2$

Answer: C

Watch Video Solution

2. If α and β are the roots of $x^2 + x + 1 = 0$, then $\alpha^{16} + \beta^{16} =$

A. $(p^2 + q)(p^2 - 3p)$

B. $(p^2 - q)(p^2 + 3q)$

C. $(p^2 + q)(p^2 + 3q)$

D. $(p^2 - q)(p^2 - 3q)$

Answer: D

Watch Video Solution

3. If $x^2 - 3x + 1 = 0$, then $\frac{x^{14} + 1}{x^7} =$

A. 1: 762

B. 2: 792

C. 3: 823

D. 4:843

Answer: D

Watch Video Solution

4. If α, β are the rots of a $x^2 + bx + c = 0$ and $\alpha + h, \beta + h$ are the roots of $px^2 + qx + r = 0$ then h=

A. $\frac{b}{a} - \frac{q}{p}$

B. $\frac{1}{2}\left(\frac{b}{a} - \frac{q}{p}\right)$

C. $-\frac{1}{2}\left(\frac{a}{b} - \frac{p}{q}\right)$

D. none of these

Answer: B

Watch Video Solution

5. Let α, β be the roots of $x^2 + ax + 1 = 0$.

Then the equation whose roots are $-\left(\alpha + \frac{1}{\beta}\right)$ and $-\left(\beta + \frac{1}{\alpha}\right)$

A. $x^2 = 0$

B. $x^2 + 2ax + 4 = 0$

C. $x^2 - 2ax + 4 = 0$

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

Answer: C

Watch Video Solution

6. Let α, β be the roots of $x^2 + x + 1 = 0$.

The equation whose roots are α^{25} and β^{22}.

A. a.$x^2 + x - 1 = 0$

B. b.$x^2 - x + 1 = 0$

C. c.$x^2 + x + 1 = 0$

D. d.none of these

Answer: C

Watch Video Solution

7. If α, β are the roots of $ax^2 + bx + c = 0$ the equation whose roots are $(\alpha + \beta)^{-1}$, $\alpha^{-1} + \beta^{-1}$ is

A. 1: $(ac)x^2 + (a + c)x + bc = 0$

B. 2: $(bc)x^2 + \left(b^2 + ac\right)x + ab = 0$

C. 3: $(ab)x^2 + \left(c^2 + ab\right)x + bc = 0$

D. 4: $(ca)x^2 + \left(b^2 + ac\right)x + ab = 0$

Answer: B

Watch Video Solution

8. If α, β are the roots of a $x^2 + bx + c = 0$ the equation whose roots are $\alpha + \frac{1}{\beta}$ and $\beta + \frac{1}{\alpha}$ is

A. $(ca)x^2 + b(c+a)x + (c+a)^2 = 0$

B. $(ca)x^2 + abx + (c+a)^2 = 0$

C. $(ca)x^2 - b(c+a)x + (c+a)^2 = 0$

D. $(ca)x^2 + b(c+a)x + c^2 = 0$

Answer: A

Watch Video Solution

9. If α, β are the roots of $x^2 - 3x + 5 = 0$ and γ, δ are the roots of $x^2 + 5x - 3 = 0$, then the equation whose roots are $\alpha\gamma + \beta\delta$ and $\alpha\delta + \beta\gamma$ is

A. $x^2 - 15x - 158 = 0$

B. $x^2 + 15x - 158 = 0$

C. x^(2)-15 x+158=0`

D. $x^2 + 15x + 158 = 0$

Answer: D

Watch Video Solution

10. If α, β are the roots of $2x^2 - x + 7 = 0$ then the equation whose roots are $2 - 3\alpha$ and $2 - 3\beta$ is

A. $2x^2 - 5x + 65 = 0$

B. $2x^2 + 5x + 65 = 0$

C. $2x^2 - 5x - 65 = 0$

D. $2x^2 + 5x - 65 = 0$

Answer: A

Watch Video Solution

11. If $2+i\sqrt{3}$ is a root of the equation $x^2+px+q=0$, where p, q are real, then (p, q)=

A. 1)(4,-7)

B. 2)(4,7)

C. 3)(-4,7)

D. 4)(-4,-7)

Answer: C

Watch Video Solution

12. If p,q,r , three positive real numbers are in A.P., then the roots of $px^2 + qx + r = 0$ are all real for :

A. all a and c

B. no a and c

C. $\left|\frac{c}{a} - 7\right| \geq 4\sqrt{3}$

D. $\left|\frac{a}{c} + 7\right| \geq 2\sqrt{3}$

Answer: C

Watch Video Solution

13. If 2 lies between the roots 'of $x^2 + (a+1)x - a - 2 = 0$ then a in

A. (-4)

B. $(4, \infty)$

C. $(-4, 4)\infty$

D. $(-\infty, -4)'$

Answer: D

Watch Video Solution

14. If the roots of $(a^2+b^2)x^2+2(ac+bd)x+(c^2+d^2)=0$ are equal then

A. ad=bc

B. $\frac{a}{c}+\frac{b}{d}=0$

C. $\frac{a}{d}=\frac{b}{c}$

D. $a+b=c+d$

Answer: A

Watch Video Solution

Watch Video Solution

15. If one root of $x^2 - x + 3a = 0$ is double the root of $x^2 - x + a = 0$ then non-zero value of ' a ' is

A. 1)1

B. 2)-1

C. 3)-2

D. 4)-3

Answer: C

Watch Video Solution

16. If the equation $ax^2 + 2bx - 3c = 0$ has non-real roots and $\left(\frac{3c}{4}\right) < (a + b)$, then c is always :

A. (-1,1)

B. (0,1)

C. (0, oo)

D. (-oo, 0)

Answer: D

Watch Video Solution

17. If α, β are the roots of $4x^2 - 16x + c = 0$, c >0 such that 1

A. 2

B. 3

C. 4

D. 5

Answer: B

Watch Video Solution

18. If a, b, c are real, $c \geq 0$ and a $x^2 + bx + c = 0$ has no real roots, then $4a - 6b + 9c$

A. A) ≥ 0

B. B) < 0

C. C) $= 0$

D. D) lies between -1 and 1

Answer: B

View Text Solution

19. The value of p for which the sum of the squares of the roots of $2x^2 - 2(p-2)x - p - 1 = 0$ is least is

A. 1

B. $\frac{3}{2}$

C. 2

D. $\frac{5}{2}$

Answer: A

Watch Video Solution

20. If α, β are the roots of $\lambda\left(x^2+x\right)+x+5$ =0 and λ_1, λ_2 are the two values of λ for which α, β are connected by the relation $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$=4, then the value of $\frac{\lambda_1}{\lambda_2}+\frac{\lambda_2}{\lambda_1}$=`

A. 254

B. 482

C. 784

D. 782

Answer: B

Watch Video Solution

21. If the roots of the equation $x^2 - bx + c = 0$ be two eanseeutive integers then $b^2 - 4ac =$

A. 3

B. -2

C. 1

D. 2

Answer: D

Watch Video Solution

22. If one root of $(a^2 - 5a + 3)x^2 + (3a - 1)x + 2 = 0$ is twice the other then $a =$

A. $\frac{2}{3}$

B. $-\frac{2}{3}$

C. $\frac{1}{3}$

D. $-\frac{1}{3}$

Answer: C

Watch Video Solution

23. The equation $(\cos\beta - 1)x^2 + (\cos\beta)x + \sin\beta = 0$ in the variable x has real roots, then β is in the interval

A. a.$(0, 2\pi)$

B. b.$(-\pi, 0)$

C. c.`(-pi/2, pi/2)

D. d.$(0, \pi)$

Answer: A

Watch Video Solution

24. Let α, β the roots of the equation (x - a) (x - b) = c , c $\neq$ 0. Then the roots of the equation $(x-\alpha)x-\beta)+c=0$ are :

A. a, c

B. b, c

C. a, b

D. $a + c, b + c$

Answer: D

Watch Video Solution

25. If $a \leq b \leq c \leq d$ then the equation $(x - a)(x - c) + 2(x - b)(x - d) = 0$ has

A. imaginary roots

B. equal roots

C. distinct real roots

D. none of these

Answer: C

Watch Video Solution

26. Both the roots of the equation :

$(x - b)(x - c) + (x - c)(x - a) + (x - a)(x - b) = 0$ are

always :

A. positive

B. negative

C. real

D. none of these

Answer: C

Watch Video Solution

27. If one root of the equation $(a-b)x^2+ax+1=0$ is double the other and if a is real, then the greatest value of b is

A. 1) $\frac{7}{6}$

B. 2) $\frac{8}{7}$

C. 3) $\frac{9}{8}$

D. 4) $\frac{10}{9}$

Answer: C

Watch Video Solution

28. If α, β be the roots of $x^2 + x + 2 = 0$ and γ, δ be the roots of $x^2 + 3x + 4 = 0$ then $(\alpha + \gamma)(\alpha + \delta)(\beta + \gamma)(\beta + \delta) =$

A. a.-18

B. b.18

C. c.24

D. d.44

Answer: C

Watch Video Solution

29. The expression $a\left(x^2-y^2\right)-bxy$ admits two linear factors for

A. a.$a + b = 0$

B. b.$a = b$

C. c.$4a = b^2$

D. d.all a and b

Answer: D

Watch Video Solution

30. If one root of $x^2 - x - k = 0$ is square of the other, then $k =$

A. a.$2 \pm \sqrt{3}$

B. b.$3 \pm \sqrt{2}$

C. c.$2 \pm \sqrt{5}$

D. d.$5 \pm \sqrt{2}$

Answer: D

Watch Video Solution

31. The value of p for which the difference between the roots of the equation $x^2 + px + 8 = 0$ is 2 are

A. a.± 2

B. b.± 4

C. c.± 6

D. d.± 8

Answer: C

Watch Video Solution

32. If one root of the equation $ax^2 + bx + c = 0$ is reciprocal of the one root

of the equation

$a_1x^2 + b_1 + x + c_1 = 0$, then :

A. $(aa_1 - cc_1)^2 = (bc_1 - b_1a)(b_1c - a_1$

B. $(ab_1 - a_1b)^2 = (bc_1 - b_1c)(ca_1 - c_1$

C. $(bc_1 - b_1c)^2 = (ca_1 - a_1c)(ab_1 - a_1$ b)

D. none of these

Answer: C

Watch Video Solution

33. If one root of the equation $5x^2 + 13x + k = 0$ is reciprocal of other, then the value of k is

A. a.0

B. b.5

C. c.$\frac{1}{6}$

D. d.6

Answer: A

Watch Video Solution

34. Let $f(x) = ax^2 + bx + c$, a, b, in R, a neq 0 satisfying $f(1) + f(2) = 0$. Then the equation $f(x) = 0$ has

A. no real root

B. 1 and 2 are real roots

C. two distinct roots

D. two equal roots

Answer: B

Watch Video Solution

35. If the roots of a $x^2 + bx + c = 0 (a \geq 0)$ be each greater than unity, then

A. a.$a + b + c = 0$

B. b.$a + b + c > 0$

C. c.$a + b + c < 0$

D. d.none of these

Answer: C

Watch Video Solution

36. If a in Z and the equation $(x-3)(x-a)+1=0$ has integral roots, then the value of ' a ' are

A. 2 or 5

B. 1 or 5

C. 1 or 4

D. 2 or 4

Answer: B

Watch Video Solution

37. If the equations $x^2 + b^2 = 1 - 2bx$ and $x^2 + a^2 = 1 - 2$ a x have one and only one root common then $|a - b| =$

A. $a + b = 2$

B. $a + b = -2$

C. $|a - b| = 2$

D. $a - b = \pm 1$

Answer: B

Watch Video Solution

38. The number of values of a such that $x^2 - 11x + a$ and $x^2 - 14x + 2$ a have a common root

A. 0

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

39. If the equations a $x^2 + 2bx + c - 0$ and a $x^2 + 2cx + b = 0, b \neq c$ have a common root, then $\frac{a}{b+c} =$

A. 1)1

B. 2)-4

C. 3)$-\frac{1}{2}$

D. 4)$-\frac{1}{4}$

Answer: B

Watch Video Solution

40. If the equations $x^2 + ax + b = 0$ and $x^2 + bx + a = 0 (a \neq b)$ have a common root, then $a + b =$

A. 0

B. 1

C. 2

D. -1

Answer: B

Watch Video Solution

41. If $x^2 - px + q = 0$ has equal integral roots, then

A. p and q are even integers

B. p and q are odd integers

C. p is an even integer and q is a perfect square of a positive integer

D. q is an even integer and p is odd

Answer: D

 Watch Video Solution

42. Find the condition that quadratic equations $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$ may have a common root.

A. -2

B. -1

C. 0

D. 1

Answer: C

Watch Video Solution

43. If both roots of the equation $x^2 - 2ax + a^2 - 1 = 0$ lie between -2 and 2, then [a] can be

A. a) $-1, 0$

B. b) 0,1

C. c) 1,2

D. d) $-1, 2$

Answer: C

Watch Video Solution

44. If alpha, beta are the roots of a $x^2 + bx + c = 0$ and $A_n = \alpha^n + \beta^n$, then, $aA_{n+2} + bA_{n+1} + cA_n =$

A. 1: 0

B. 2: 1

C. 3: $a + b + c$

D. 4: a b c

Answer: A

Watch Video Solution

45. If α, β are the roots of $x^2 - ax + b = 0$ and $A_n = {}'\alpha^{n} + \beta^n$, then $A_{n+1} =$

A. $aA_n + bA_{n-1}$

B. $aA_n - bA_{n-1}$

C. $bA_{n-1} - aA_n$

D. $bA_n + aA_{n-1}$

Answer: A

Watch Video Solution

46. In the equation $x^2 + px + q = 0$ the coefficient of x was incorrectly written as 17 insted of 13 . Then the roots were found to be -2 and -15 . The correct roots are

A. $-1, \ -3$

B. $-3, \ -10$

C. $-5, \ -3$

D. $-10, \ -1$

Answer: B

Watch Video Solution

47. If sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals, then $\frac{a}{c}, \frac{b}{a}$ and $\frac{c}{b}$ are in :

A. $A.P$

B. $G.P$

C. $H.P$

D. none of these

Answer: B

Watch Video Solution

48. If a, b, c are in $A.P$ and $(b-c)x^2+(c-a)x+(a-b)=0$ and $2(c+a)x^2+(b+c)x=0$ have a common root then

A. 1)a^2, b^2, c^2 are in $A.P$

B. 2)a^2, c^2, b^2 are in $A.P$

C. 3)a^2, c^2, b^2 are in $G.P$

D. 4)none of these

Answer: C

 Watch Video Solution

49. If A,G and H are respectively A.M.,G.M. and H.M. of three positive numbers a,b and c, then the equation whose roots are a,b,c is given by :

A. both roots as positive tion

B. one root is a negative tion and the other

positive tion

C. at least one root will be an integer

D. none of, these

Answer: B

Watch Video Solution

50. If the ratio of the roots of the equation a

$x^2 + bx + c = 0$ is equal to the ratio of the

roots of the equation $x^2 + x + 1 = 0$, then a, b , c are in

A. A.P

B. G.P

C. $H.\ P$

D. none of these

Answer: B

Watch Video Solution

51. If $a, b, care \in H. P, thentheequationa$(b-c) x^(2)+b(c-a) x+c(a-b)=0`

A. has real and distinct roots

B. has equal roots

C. has no real roots

D. none of these

Answer: B

View Text Solution

52. The quadratic equation whose roots are A.M and H . M between the roots of the equation a $x^2 + bx + c = 0$ is

A. 1: $abx^2 + \left(b^2 + 4ac\right)x + bc = 0$

B. 2: $2abx^2 + \left(b^2 + 4ac\right)x + 2bc = 0$

C. 3: $2abx^2 + \left(b^2 + 4ac\right)x + bc = 0$

D. 4: $abx^2 + 2\left(b^2 + 4ac\right)x + bc = 0$

Answer: B

Watch Video Solution

53. Root(s) of the equation $9x^2 - 18|x| + 5 = 0$ belonging to the domain of the function $f(x) = \log\left(x^2 - x - 2\right)$ is (are)

A. $-\frac{5}{3}, -\frac{1}{3}$

B. $\frac{5}{3}, \frac{1}{3}$

C. $-\frac{5}{3}$

D. $-\frac{1}{3}$

Answer: B

Watch Video Solution

54. Real roots of the equation $x^2 + 6|x| + 5 = 0$ are

A. 1) `-1,-5

B. 2)$1, 5$

C. 3)$1, \ -1$

D. 4)no real roots

Answer: C

Watch Video Solution

55. The sum of the roots of the equation $\left|x^2+4x+3\right|+2x+5=0$ is

A. $5+\sqrt{3}$

B. $5-\sqrt{3}$

C. $-5+\sqrt{3}$

D. $-5-\sqrt{3}$

Answer: D

Watch Video Solution

56. The set of all real numbers x for which $x^2 - |x+2| + x > 0$ is

A. 1) $(-\infty, -2) \cup (2, \infty)$

B. 2) $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$

C. 3) $(-\infty, -1) \cup (1, \infty)$

D. 4) $(\sqrt{2}, \infty)$

Answer: D

Watch Video Solution

57. The sum of the real roots of the equation $x^2 + |x| - 12 = 0$ is

A. a) 0

B. b) 2

C. c) 4

D. d) -4

Answer: B

Watch Video Solution

58. The sum of real roots of the equation $|x-2|^2 + |x-2| - 2 = 0$ is

A. 0

B. 8

C. 4

D. -4

Answer: A

Watch Video Solution

59. The sum of real roots of the equation $|x-2|^2+|x-2|-2=0$ is

A. 1)0

B. 2)8

C. 3)-2

D. 4)4

Answer: D

Watch Video Solution

60. The sum of distinct values of x such that $\left|x^2 - x - 6\right| = x + 2$ is

A. 0

B. 2

C. -2

D. 4

Answer: D

Watch Video Solution

61. Range of the function $f(x) = \frac{x^2 + x + 2}{x^2 + x + 1}, x \in R$ is :

A. 1: R

B. 2: $R - (1)$

C. 3: $R - (-3, -2)$

D. 4: $R - (-3, 2)$

Answer: B

Watch Video Solution

62. If x in R the expression $\frac{x^2 + 2x - 11}{x - 3}$ does not take value in

A. $(-\infty, 4)$

B. $(12, \infty)$

C. $R - (4, 12)$

D. $(4, 12)$

Answer: D

Watch Video Solution

63. The least value of $\frac{6x^2 - 18x + 21}{6x^2 - 18x + 17}$ is

A. 1: 7

B. 2: 7

C. 3: 3

D. 4: 1

Answer: D

View Text Solution

64. If $x^2 - 3x + 2 \geq 0$ and $x^2 - 3x - 4 \leq 0$ then

A. $|x| \leq -2$

B. $x \in [-1, 1) \cup [2, 4]$

C. $x \in [-1, 1]$

D. $x \in (2, 4)$

Answer: B

Watch Video Solution

65. If $\frac{x^2 - |x| - 2}{2|x| - x^2 - 2} \geq 2$, then

A. 1: $x \in (-1, 1)$

B. 2: $x \in \left(-\frac{2}{3}, \frac{2}{3}\right)$

C. 3: $\left(-1, -\frac{2}{3}\right) \cup \left(\frac{2}{3}, 1\right)$

D. 4: $\left(-\infty, -\frac{2}{3}\right) \cup \left(\frac{2}{3}, \infty\right)$

Answer: C

Watch Video Solution

66. The function $\frac{x^2+2x+c}{x^2+4x+3c}$ assumes all real values only if

A. 1)$c=1$

B. 2)$c \geq 0$

C. 3)$0<c<1$`

D. 4)$|c| \leq 1$

Answer: C

Watch Video Solution

67. The least value of $\frac{x+2}{2x^2+3x+6}$ is

A. 1: -1

B. 2: $-\frac{1}{3}$

C. 3: $-\frac{1}{13}$

D. 4: $\frac{1}{3}$

Answer: C

Watch Video Solution

68. If $a+b+c=0$, then the equation $3ax^2+2bx+c=0$ has :

A. imaginary roots

B. one root in $[-2,-1]$ and the other in $[2,3]$

C. atleast in $[0,1]$

D. none of these

Answer: C

Watch Video Solution

69. If the product of the roots of the equation $x^2 - 3kx + 2e^{2\log k}$ - 1 = 0 is 7, then the roots of the equation are real for k equal to :

A. integers

B. rational

C. irrational

D. imaginary

Answer: C

Watch Video Solution

70. Let a, b,c $\in$ R and a $\neq$ 0. If α is a root of a^2x^2 + bx + c = 0 , β is a root of a^2x^2 - bx - x = 0 and 0 $< \alpha < \beta$. Then the equation $a^2x^2 + 2bx$ + 2c = 0 has a root γ that always satisfies :

A. $\gamma = \frac{\alpha + \beta}{2}$

B. $\gamma = \alpha + \frac{\beta}{2}$

C. $\gamma = \frac{\alpha}{2} + \beta$

D. $\alpha \leq \gamma \leq \beta$

Answer: A

Watch Video Solution

71. If α and β the roots of $x^2 + px + q = 0$ and α^4, β^4 are the roots of $x^2 - rx + s = 0$, then the equation $x^2 - 4qx + 2q^1 - r = 0$ has always :

A. two real roots

B. two negative roots

C. two positive roots

D. one positive and one negative root

Answer: B

Watch Video Solution

72. The set of values of p for which the roots of the equation $3x^2 + 2x + p(p-1) = 0$ are of opposite signs is

A. 1: $(-\infty, 0)$

B. 2: $(0, 1)$

C. 3: $(1, \infty)$

D. 4: $(0, \infty)$

Answer: D

Watch Video Solution

73. Let α and β be the roots of the equation $x^2 + x + 1 = 0$. The equation whose roots are α^{19} and β^7 is

A. $x^2 - x - 1 = 0$

B. $x^2 - x + 1 = 0$

C. $x^2 + x - 1 = 0$

D. $x^2 + x + 1 = 0$

Answer: A

Watch Video Solution

74. If p,q,r are in A.P. and are positive, the roots of the quadratic equation $px^2 + qx + r = 0$ are real for :

A. $\left|\frac{r}{p}-7\right| \geq 4\sqrt{3}$

B. $\left|\frac{p}{r}-7\right| < 4\sqrt{3}$

C. all p and r

D. no p and r

Answer: D

Watch Video Solution

75. The sum of real roots of the equation $|x-2|^2+|x-2|-2=0$ is

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

76. In a triangle PQR, $\angle R = \pi/2$, If $\tan(P/2)$. and $\tan(Q/2)$ are the roots of the equation : $ax^2 + bx + c = 0a \neq 0$, then :

A. $a + b = c$

B. $b + c = 0$

C. $a + c = b$

D. $b = c$

Answer: A

Watch Video Solution

77. If the roots of the equation $x^2 - 2ax + a^2 + a - 3 = 0$ are real and less then 3, then :

A. $a < 2$

B. $2 \leq a \leq 3$

C. $3 < a \leq 4$

D. $a \geq 4$

Answer: D

Watch Video Solution

78. If $b \geq a$, then the equation $(x - a)(x - b) - 1 = 0$ has

A. 1: both the roots in $[a, b]$

B. 2: both the roots in $(-\infty, a]$

C. 3: both roots in $(b, \infty]$

D. 4: one root in $(-a, a)$ and $other \in (b, a)$

Answer: D

Watch Video Solution

79. For the equation $3x^2 + px + 3 = 0, p > 0,$

if one root is square of the other, then p=

A. $\frac{1}{3}$

B. 1

C. 3

D. $\frac{2}{3}$

Answer: A

Watch Video Solution

80. If

$x^2 + (a - b)x + (1 - a - b) = 0, a, b \in R$

has unequal roots for all values of b, then

A. 1) $-1 < a < 1$

B. 2) $a > 1$

C. 3) $a < -1$

D. 4) 0

Answer: B

Watch Video Solution

81. If one root of the equation $x^2 + px + q = 0$ is square of the other root, then :

A. $p^3 - (3p - 1)q + q^2 = 0$

B. $p^3 - (3p + 1)q + q^2 = 0$

C. $p^3 + (3p - 1)q + q^2 = 0$

D. $p^3 + (3p + 1)q + q^2 = 0$

Answer: C

Watch Video Solution

82. If $x^2 + 2ax + (10 - 3a) > 0$ for all x, then

A. $a < -5$

B. $-5 < a < 2$

C. $a > 5$

D. $2 \leq a \leq 5$

Answer: A

Watch Video Solution

83. Let $f(x) = ax^2 + bx + c, \quad a \neq 0$ and $\Delta = b^2 - 4ac$. If $\alpha + \beta, \alpha^2 + \beta^2$ and $\alpha^3 + \beta^3$ are in G.P, then

A. $\Delta \neq 0$

B. $\Delta = 0$

C. $c\Delta = 0$

D. b c ne 0

Answer: A

Watch Video Solution

84. Let a,b,c be the sides of a triangle no two of them are equal and $\lambda \in R$ if the roots of the equation $x^2 + 2(a+b+c) + 3\lambda$ (ab+bc+ca=0) are real then

A. $\lambda < \frac{4}{3}$

B. $\lambda > \frac{5}{3}$

C. $\lambda \in \left(\frac{1}{3}, \frac{5}{3}\right)$

D. $\lambda \in$ ((4)/(3), (5)/(3))`

Answer: D

Watch Video Solution

85. If α, β are the roots of the equation $x^2 + x + 1 = 0$, then the equation whose roots are $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ is

A. $x^2 + x + 1 = 0$

B. $x^2 - x + 1 = 0$

C. $x^2 - x - 1 = 0$

D. $x^2 + x - 1 = 0$

Answer: A

Watch Video Solution

86. Let α, β be the roots of the equation $x^2 - px + r = 0$ and $\frac{\alpha}{2}, 2\beta$ be the roots of the equation $x^2 - qx + r = 0$ then the value of r is

A. $\frac{2}{9}(p-q)(2q-\neg p)$

B. $\frac{2}{9}(q-p)(2p-q)$

C. $\frac{2}{9}(q-2p)(2q-p)$

D. $\frac{2}{9}(2p-2q)(2q-p)$

Answer: C

Watch Video Solution

87. The smallest value of k for which both the roots of the equation $x^2 - 8kx + 16\left(k^2 - k + 1\right) = 0$ are real, distinct and have values atleast 4 is

A. 1)2

B. 2)3

C. 3)4

D. 4)none of these

Answer: A

Watch Video Solution

88. The minimum positive value of $\frac{x^2+2x+4}{x+2}$ is

A. 0

B. 1

C. 2

D. 3

Answer: B

Watch Video Solution

89. Let p and q be real number such that $p \neq 0, p^3 \neq q$ and $p^3 \neq -q$. If α and β non-zero complex number satifying $\alpha + \beta = -p$ and $\alpha^3 + \beta^3 = q$ then a quadratic equation having $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ as its roots is :

A.

$$(p^3+q)x^2-(p^3+2q)x+(p^3+q)=0$$

B.

$$(p^3+q)x^2-(p^3-2q)x+(p^3+q)=0$$

C.

$$(p^3-q)x^2-(5p^3-2q)x+(p^3\div q)=0$$

D.

$$(p^3-q)x^2-(5p^3+2q)x+(p^3-q)=0$$

Answer: A

Watch Video Solution

90. If p and q are the roots of the equation $x^2 + px + q = 0$ then

A. $p = 1$

B. $p = 1 \text{ or } 0$

C. $p = -2$

D. $p = -2 \text{ or } 0$

Answer: A

Watch Video Solution

91. If the difference between the roots of $x^2 + ax + b = 0$ is same as that of $x^2 + bx + a = 0$, a not equal to b', then

A. $a + b + 4 = 0$

B. $a + b - 4 = 0$

C. $a - b - 4 = 0$

D. $a - b + 4 = 0$

Answer: A

Watch Video Solution

92. If $\alpha \neq \beta$ and $\alpha^2 = 5\alpha - 3, \beta^2 = 5\beta - 3,$ then the equation having α/β and $\frac{\beta}{\alpha}$ as its roots, is :

A. $3x^2 + 19x + 3 = 0$

B. $3x^2 - 19x + 3 = 0$

C. $3x^2 - 19x - 3 = 0$

D. $x^2 - 16x + 1 = 0$

Answer: B

Watch Video Solution

93. The number of real roots of the equation $|x|^2 - 3|x| + 2 = 0$ is

A. a)4

B. b)3

C. c)2

D. d)1

Answer: A

Watch Video Solution

94. If one root of the equation $x^2 + px + 12 = 0$ is 4, while the equation $x^2 + px + q = 0$ has equal roots then the value of q is

A. $\frac{49}{4}$

B. $\frac{4}{49}$

C. 4

D. none of these

Answer: A

Watch Video Solution

95. If $2\ a + 3b + 6c = 0, a, b, c \in R$ then the equation a $x^2 + bx + c = 0$ has a root in

A. 1)$(0, 1)$

B. 2)$(2, 3)$

C. 3)$(4, 5)$

D. 4)none of these

Answer: A

Watch Video Solution

96. If $(1-p)$ is a root of the quadratic equation $x^2+px+(1-p)=0$ then its roots are

A. $-1, 2$

B. $-1, 1$

C. $0, -1$

D. $0, 1$

Answer: C

Watch Video Solution

97. The value of a for which the sum of the squares of the roots of the equation $x^2 - (a-2)x - a - 1 = 0$ assumes the least value is

A. 0

B. 1

C. 2

D. 3

Answer: B

Watch Video Solution

98. If both the roots of the quadratic equation $x^2 - 2kx + \left(k^2 + k - 5\right) = 0$ are less than 5, then k lies in the interval

A. $[4, 5]$

B. $(- \infty, 4)$

C. $(6, \infty)$

D. $[5, 6]$

Answer: B

Watch Video Solution

99. If x is real, the maximum value of $\frac{3x^2+9x+17}{3x^2+9x+7}$ is

A. 1) $\frac{1}{4}$

B. 2) 41

C. 3) 1

D. 4) $\frac{17}{7}$

Answer: B

Watch Video Solution

100. All the values of m for which both roots of the equation $x^2 - 2mx + \left(m^2 - 1\right) = 0$ are greater than -2 but less than 4 lie in the interval

A. 1: $(-2, 0)$

B. 2: $(3, \infty)$

C. 3: $(-1, 3)$

D. 4: $(1, 4)$

Answer: C

Watch Video Solution

101. If the roots of the quadratic equation $x^2 + px + q = 0$ are $\tan 30^\circ$ and $\tan 15^\circ$ respectively, then the value of $2 + q - p$ is

A. 2

B. 3

C. 0

D. 1

Answer: B

Watch Video Solution

102. If the difference between the roots of the equation $x^2 + ax + 1 = 0$ is less than $\sqrt{5}$, then the set of possible values of a is

A. $(3, \infty)$

B. $(-\infty, -3)$

C. $(-3, 3)$

D. $(-3, \infty)$

Answer: C

Watch Video Solution

103. The quadratic equations :

$x^2 - 6x + a = 0$ and $x^2 - cx + 6 = 0$

have one root in common. The other roots of the first and second equations are integers in the ratio 4 : 3.

then the common root is :

A. 3

B. 2

C. 1

D. 4

Answer: B

Watch Video Solution

104. If the roots of the equation $bx^2 + cx + a = 0$ be imaginary then fro all real value4s of x the expression $3b^2x^2 + 6bcx + 2c^2$ is

A. greater than 4 a b

B. less than 4 a b

C. greater than -4 a b

D. less than -4 a b

Answer: C

Watch Video Solution

105. If α, β are the roots of the equation : $x^2 + x\sqrt{\alpha} + \beta = 0$, then the values of α and β are :

A. $\alpha = 1, \beta = -1$

B. $\alpha = 1, \beta = -2$

C. $\alpha = 2, \beta = 1$

D. $\alpha = 2, \beta = -2$

Answer: B

Watch Video Solution

106. The number of solutions of the equation :

$\sin\left(e^{x}\right) = 5^{x} + 5^{-x}$ is :

A. 0

B. 1

C. 2

D. infinitely many

Answer: A

 Watch Video Solution

107. If the sum of the roots of the equation $a x^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals, then

A. `c^(2) b', a^(2) c, b^(2)a are in A.P

B. c^2b, a^2c, b^2 a are in AP

C. $\frac{b}{c}, \frac{a}{b}, \frac{c}{a}$ are in G.P.

D. $\frac{a}{b}, \frac{b}{c}, \frac{c}{a}$ are in G.P.

Answer: A

Watch Video Solution

108. Given that a $x^2 + bx + c$ has no real roots and $a + b + c < 0$ then,

A. 1) $c < 0$

B. 2)$c > 0$

C. 3)$c < 0$

D. 4)$c \neq 0$

Answer: C

Watch Video Solution

109. The roots of the equation $\left|x^2 - x - 6\right| = x + 2$ are

A. 1) $-2, 1, 4$

B. 2) $0, 2, 4$

C. 3) $0, 1, 4$

D. 4) $-2, 2, 4$

Answer: D

Watch Video Solution

110. If a, b, c are positive real numbers, then the number of real roots of the equation a $x^2 + b|x| + c = 0$ is

A. a..2

B. b.4

C. c.0

D. d.none of these

Answer: C

Watch Video Solution

111. The value of 'a' for which the equation $x^3 + ax + 1 = 0$ and $x^4 + ax^2 + 1$ =0 has a common root is :

A. 2

B. -2

C. 0

D. none of these

Answer: B

Watch Video Solution

112. If α and β are the roots of $x^2 + qx + 1 = 0$ and γ, δ the roots of

$x^2 + qx + 1 = 0$, then the value of

$(\alpha - \gamma)(\beta - \gamma)(a + \delta)\beta + \delta)$ is :

A. $p^2 - q^2$

B. $q^2 - p^2$

C. p^2

D. q^2

Answer: B

Watch Video Solution

113. If a,b,c are in G.P.L, then the equations $ax^2 + 2bx + c = 00$ and $dx^2 + 2ex + f = 0$ have a common root if $\frac{d}{a}, \frac{e}{b}, \frac{f}{c}$ are in :

A. A.P

B. G.P

C. H.P

D. none of these

Answer: A

Watch Video Solution

114. Let x_1, x_2 be the roots of the equation $x^2 - 3x + p = 0$ and let x_3, x_4 be the roots of the equation $x^2 - 12x + q = 0$. If the numbers x_1, x_2x_3, x_4 (in order) form an increasing G.P. then,

A. $p = 2, q = 16$

B. $p = 2, q = 32$

C. $p = 4, q = 16$

D. $p = 4, q = 32$

Answer: B

Watch Video Solution

115. Both the roots of the equation :

$(x - b)(x - c) + (x - c)(x - a) + (x - a)(x - b) = 0$ are always :

A. positive

B. negative

C. real

D. none of these

Answer: C

Watch Video Solution

116. If $x^2 + x + 1$ is a factor of a $x^3 + bx^2 + cx + d$, then the real root of $ax^3 + bx^2 + cx + d = 0$ is

A. $\frac{d}{a}$

B. $-\frac{d}{a}$

C. $-\frac{b}{a}$

D. $-\frac{c}{a}$.

Answer: B

Watch Video Solution

117. If $a \leq 0$then the real values of x satisfying $x^2 - 2a|x - a| - 3a^2 = 0$ are

A. a.$a\left(1 - \sqrt{2}\right), a\left(- 1 + \sqrt{6}\right)$

B. b.$a\left(1 + \sqrt{2}\right), a\left(1 - \sqrt{6}\right)$

C. c.$a\left(1 - \sqrt{2}\right), a\left(1 - \sqrt{6}\right)$

D. d.none of these

Answer: A

Watch Video Solution

118. If $x^2 - 3x + 2$ is a factor of $x^4 - px^2 + q$, then the values of p and q are

A. $5, -4$

B. $5, 4$

C. $-5, 4$

D. $-5, -4$

Answer: B

Watch Video Solution

119. If the equations $x^2 + b^2 = 1 - 2bx$ and $x^2 + a^2 = 1 - 2$ a x have one and only one root common then $|a - b| =$

A. a.1

B. b.0

C. c.2

D. d.none of these.

Answer: C

Watch Video Solution

120. If the product of the roots of the equation $x^2 - 3kx + 2e^{2\log k}$ - 1 = 0 is 7, then the roots of the equation are real for k equal to :

A. 1

B. 2

C. 3

D. 4

Answer: D

Watch Video Solution

121. Let a, b, c be real. If $ax^2 + bx + c = 0$ has two real roots α and β such that $\alpha < -1$ and $\beta > 1$, then $1 + \frac{c}{a} + \left|\frac{b}{a}\right|$ is

A. < 0

B. > 0

C. ≤ 0

D. none of these

Answer: A

Watch Video Solution

Watch Video Solution

122. Let $(\sin a)x^2 + (\sin a)x + (1 - \cos a) = 0$. The set of values of a for which roots of this equation are real and distinct is

A. 1: $\left(0, 2\frac{\tan^{-1}(1)}{4}\right)$

B. 2: $\left(0, \frac{2\pi}{3}\right)$

C. 3: $(0, \pi)$

D. 4: $(0, 2\pi)$

Answer: A

Watch Video Solution

123. If p, q, are real and $p \neq q$ then the roots of the equation $(p-q)x^2 + 5(p+q)x - 2(p-q) = 0$ are

A. a.real and equal

B. b.real and unequal

C. c.unequal and irrational

D. d.nothing can be said

Answer: D

Watch Video Solution

124. The value of ' c ' for which $\left|\alpha^2-\beta^2\right|=\frac{7}{4}$ where alpha and beta are the roots of $2x^2+7x+c=0$ is

A. 1)4

B. 2)0

C. 3)6

D. 4)2

Answer: C

Watch Video Solution

125. If alpha, beta are the roots of the equation $\lambda \left(x^2 - x\right) + x + 5 = 0$ and if lambda_1 and lambda_2 are two values of lambda obtained from $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} = \frac{4}{5}$, then $\frac{\lambda_1}{\lambda_2^2} + \frac{\lambda_2}{\lambda_1^2} =$

A. 1: 4192

B. 2: 4144

C. 3: 4096

D. 4: 4048

Answer: D

Watch Video Solution

126. If α and β are the rotos of a $x^2 + bx + c = 0$ the equation whose roots are $2 + \alpha$ and $2 + \beta$ is

A. $ax^2 + x(4a - b) + 4a - 2b + c = 0$

B. $ax^2 + x(4a - b) + 4a + 2b + c = 0$

C. $ax^2 + x(b - 4a) + 4a + 2b + c = 0$

D. $ax^2 + x(b - 4a) + 4a - 2b + c = 0$

Answer: D

Watch Video Solution

127. If α, β are the rots of a $x^2 + bx + c = 0$ and $\alpha + h, \beta + h$ are the roots of $px^2 + qx + r = 0$ then h=

A. $b + q$

B. $b - q$

C. $\frac{b+q}{2}$

D. $\frac{b-q}{2}$

Answer: D

Watch Video Solution

128. If $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$ have a common root, then the numberical value of a + b is :

A. 1

B. 0

C. -1

D. none of these

Answer: C

Watch Video Solution

129. The minimum value of $2x^2 + x - 1$ is

A. a.$-\frac{1}{4}$

B. b. $\frac{3}{4}$

C. c. $-\frac{9}{8}$

D. d. $\frac{9}{4}$

Answer: C

Watch Video Solution