MATHS

BOOKS - NDA PREVIOUS YEARS

POLYNOMIAL,QUADRATIC EQUATION & INEQUALITIES

Math

1. If the roots of the equation $4B^2 + \lambda B - 2 = 0$ are of the from $\dfrac{k}{k+1}$ and $\dfrac{k+1}{k+2}$, then what is the value of λ?

  A. 2k

  B. 7

  C. 2

  D. $k+1$

Answer: B

2. Given $4a - 2b + c = 0$ where a,b,c $\in$ R, which of the following statement is/are not true in general?

1. $(x + 2)$ will always be a factor of the expression

2. $(x - 2)$ will always be a factor of the expression $ax^2 + bx + c$.

3. There will always be a factor of the expression $ax^2 + bx + c$ different from $(x + 2)$

Select the correct answer using the code given below:

    A. 1 and 2 only

    B. 1,2 and 3

    C. 2 only

    D. 1 only

Answer: B

3. If the sum of the squares of the squares of the roots of $x^2 - (p - 2)x - (p + 1) = 0(p \in R)$ is 5, then what is the value of p?

A. 0

B. -1

C. 1

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

Answer: C

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4. What is the number of real solutions of $|x^2 - x - 6| = x + 2$?

A. 4

B. 3

C. 2

D. 1

Answer: B

5. If the roots of $x^2 - 2mx + m^2 - 1 = 0$ lie between -2 and $4, then$

A. $-1 \leq m \leq 3$

B. $-3 \leq m \leq 3$

C. $-3 \leq m \leq 5$

D. $-1 \leq m \leq 5$

Answer: B

6. If $(\log_3 x)^2 + \log_3 x < 2$, then which one of the following is correct?

A. $0 < x < \dfrac{1}{9}$

B. $\dfrac{1}{9} \leq x \leq 3$

C. $3 < x < \infty$

D. $\dfrac{1}{9} \leq x \leq 3$

Answer: B

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7. The number of integral values of a for which the equation $\cos 2x + a \sin x = 2a - 7$ possessess a solution.

A. $a < 2$

B. $a \geq 8$

C. $a > 8$

D. a is any integar < -2

Answer: B

8. If $\sin\theta$ and $\cos\theta$ are the roots of $ax^2 + bx + c = 0$, then constants a, b,c will satisfy which one of the following conditions?

A. $a^2 + b^2 + 2ac + = 0$

B. $a^2 + b^2 - 2ac = 0$

C. $a^2 - b^2 + 2ac = 0$

D. $-a^2 + b^2 + 2ac = 0$

Answer: C

9. If $a^2 + b^2 + c^2 = 0$, then what is

$$\frac{\left(a^4 - b^4\right)^3 + \left(b^4 - c^4\right)^3 + \left(c^4 - a^4\right)^3}{\left(a^2 - b^2\right)^3 + \left(b^2 - c^2\right)^3 + \left(c^2 - a^2\right)^3}$$ equal to?

A. $a^2b^2c^2$

B. $-a^2b^2c^2$

C. abc

D. $3a^2b^2c^2$

Answer: B

10. If $0 < x < y < \pi$,then which one of the following is correct?

A. $x - \cos x > y - \cos y$

B. $x - \cos x < y - \cos y$

C. $x + \cos x > y \cos y$

D. $x + \cos x < y + \cos y$

Answer: B

11. What is the $(m-1)^{th}$ root of $\left[(a^m)^m - \left(\dfrac{1}{m}\right)\right]^{\frac{1}{m+1}}$?

A. $a^{m+(1/m)}$

B. $a^{m-(1/m)}$

C. a

D. 1

Answer: C

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12. Let $a, b \in \{1, 2, 3\}$. What is the number of equations of the form $ax^2 + bx + 1 = 0$ having real roots?

A. 1

B. 2

C. 5

D. 3

Answer: D

13. If $px^2 + qx + r = p(x - a)(x - B)$, and $p^3 + pq + r = 0$, p,q and

r being real numbers, then which of the following is not possible?

A. $\alpha = \beta = p$

B. $\alpha \neq \beta = p$

C. $\alpha = \beta \neq p$

D. $\beta \neq \alpha = p$

Answer: A

14. If the equation $x^2 + k^2 = 2(k + 1)x$ has equal roots, then what is the value of K?

A. $-\dfrac{1}{3}$

B. $-\dfrac{1}{2}$

C. 0

D. 1

Answer: B

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15. If $x = a^{1/3} - a^{-1/3}$, then what is $x^3 + 3x$ equal to ?

A. zero

B. $a + \left(\dfrac{1}{a}\right)$

C. $a - \left(\dfrac{1}{a}\right)$

D. $a^3 + \left(\dfrac{1}{a^3}\right)$

Answer: C

16. If $x^{1/3} + y^{1/3} + z^{1/3} = 0$ then what is $(x + y + z)^3$ equal to ?

A. 1

B. 3

C. 3xyz

D. 27 xyz

Answer: D

17. If α, β are the roots of $ax^2 + 2bx + c = 0$ and $\alpha + \delta, \beta + \delta$ be those

of $Ax^2 + 2Bx + C = 0$ then prove that $\dfrac{b^2 - ac}{B^2 - AC} = \left(\dfrac{a}{A}\right)^2$

A. $(b/B)^2$

B. $(a/A)^2$

C. $(a^2b^2)/(A^2B^2)$

D. $(ab)/(AB)$

Answer: B

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18.   If

α, β are the roots of the equation $ax^2 + bx + c = 0,$ then what is the va

?

A. $a/(bc)$

B. b/ac

C. $-b/(ac)$

D. $-a/(bc)$

Answer: B

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19.   If

α, β are the roots of the equation $x^2 - 2x - 1 = 0$, then what is the value

A. -2

B. 0

C. 30

D. 34

Answer: D

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20. Which one of the following values of x, y satisfies the in equation

$2x + 3y \geq 6, x \geq 0, y \geq 0$?

A. x=0,y=3

B. x=1,y=2

C. x=1,y=1

D. $x = 4, y = 0$

Answer: C

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21. What is the value of x at the intersection of $y = \dfrac{8}{(x^2 + 4)}$ and $x + y = 2?$

A. 0

B. 1

C. 2

D. -1

Answer: A

22. If the roots of the equation $x^2 - (a - 1)x + (a + b) = 0$ and $ax^2 - 2x + b = 0$ are identical, then what are the values of a and b?

A. $a = 2, b = 4$

B. $a = 2, b = -4$

C. $a = 1, b = \dfrac{1}{2}$

D. $a = -1, b = -\dfrac{1}{2}$

Answer: B

23. How many real values of x satisfy the equation $|x| + |x - 1| = 1$?

A. 1

B. 2

C. Infinite

D. No value of x

Answer: C

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24. What is the number of digits in the numeral form of 8^{17} ? $\left(Given \log_{10}^{2} = \ = 0.3010 \right)$

A. 51

B. 16

C. 15

D. 14

Answer: B

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25. If α and β are the roots of the equation $x^2 + x + 1 = 0$, then what is the equation whose roots are α^{19} and β^7 ?

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: D

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26. If α and β are the roots of the equation $x^2 + 6x + 1 = 0$, then what is $|\alpha - \beta|$ equal to?

A. 6

B. $3\sqrt{3}$

C. $4\sqrt{2}$

D. 12

Answer: C

27. If

$$r^{1/3} + \frac{1}{r^{1/3}} = 3 \ \text{ for a real number } \ r \neq 0, \ \text{ then what is } \ r + \frac{1}{r}$$

equal to ?

A. 27

B. 36

C. 9

D. 18

Answer: D

28. The number of rows in a lecture hall equals the number of seats in a row. If the number of rows is reduced by 10, the number of seats is increased by 300. If x denotes the number of rows in the lecture hall, then what is the value of x?

A. 10

B. 15

C. 20

D. 30

Answer: D

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29. If

α, β are the roots of the equation $lx^2 - mx + m = 0, l \neq m, l \neq 0$, then which one of the following statement is correct ?

A. $\sqrt{\dfrac{\alpha}{\beta}} + \sqrt{\dfrac{\beta}{\alpha}} - \sqrt{\dfrac{m}{l}} = 0$

B. $\sqrt{\dfrac{\alpha}{\beta}} + \sqrt{\dfrac{\beta}{\alpha}} + \sqrt{\dfrac{m}{l}} = 0$

C. $\dfrac{\sqrt{\alpha + \beta}}{\alpha\beta} - \sqrt{\dfrac{m}{l}} = 0$

D. The arithmetic mean of α and β is the same as their geometric mean

Answer: A

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30. Find the value of k for real and equal roots

. $(k + 1)x^2 - 2(k - 1)x + 1 = 0$

A. $k = 0 only$

B. $k = -3 only$

C. $k = 0$ or $k = 3$

D. $k = 0$ or $k = -3$

Answer: C

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31. If the roots of an equation $ax^2 + bx + c = 0$ are positive , then which one of the following is correct ?

A. Signs of a and c should be like

B. Signs of b and c should be like

C. Signs of a and b should be like

D. None of these

Answer: A

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32. Which one of the following is correct ? If $4 < x^2 \leq 9$, then

A. $2 < x < 3 only$

B. $-3 < x < -2 only$

C. $2 < x < 3, \ -3 < x < -2$

D. None of these

Answer: C

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33. If α and β are the roots of the equation $ax^2 + bx + c = 0$, then what are the roots of the equation $cx^2 + bx + a = 0$?

A. $\beta, \ \dfrac{1}{\alpha}$

B. $\alpha, \ \dfrac{1}{\beta}$

C. $-\alpha, \ -\beta$

D. $\dfrac{1}{\alpha}, \ \dfrac{1}{\beta}$

Answer: D

34. If x and y are real numbers such that $x > y$ and $|x| > |y|$,then which one of the following is correct ?
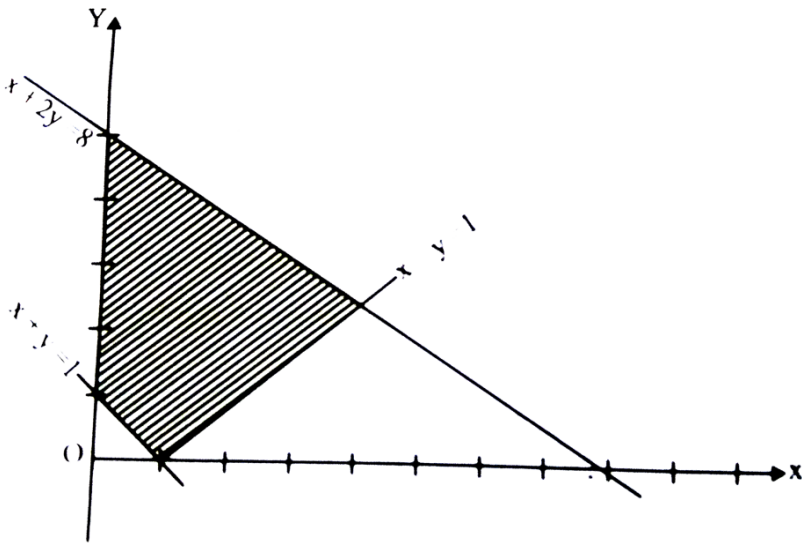
A. $x > 0$

B. $y > 0$

C. $y < 0$

D. $x < 0$

Answer: A

35. What are the linear constraints for which the shaded area in the above figure is the solution set ?

A. $x - y \geq 1, x = 2y \leq 8, x + y \geq 1, x, y \geq 0$

B. $x - y \leq 1, x = 2y \geq 8, x + y \leq 1, x, y \geq 0$

C. $x - y \leq 1, x + 2y \leq 8, x + y \geq 1, x, y \geq 0$

D. $x - y \leq , x + 2y \leq 8, x + y \leq 1, x, y \geq 0$

Answer: C

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36. If x is real and $x^2 - 3x + 2 > 0$, $x^2 - 3x - 4 \leq 0$, then which one of the following is correct?

    A. $-1 \leq x \leq 4$

    B. $2 \leq x \leq 4$

    C. $-1 < x < 1$

    D. $-1 \leq x < 1$ or $2 < x \leq 4$

Answer: D

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37. If $x = 2^{1/3} - 2^{-1/3}$ then what is the value of $2x^3 + 6x$?

    A. 1

    B. 2

    C. 3

    D. 4

Answer: C

38. What is the value of

$$\sqrt{5\sqrt{5\sqrt{5\sqrt{\ldots\ldots\infty}}}}$$

A. 5

B. $\sqrt{5}$

C. 1

D. $(5)^{1/4}$

Answer: A

39. For the real numbers p,q,r,x,y,let $p < x < q$ and $p < y < r$.

A. $p < x < x < r$

B. $p < x < q < r$

C. $p < y < x < q$

D. None of these

Answer: B

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40. One root of the equation $x^2 = px + q$ is reciprocal of the other and

$p \neq \pm 1$. What is the value of q ?

A. $q = -1$

B. $q = -1$

C. $q = 0$

D. $q = \dfrac{1}{2}$

Answer: A

41. If the equation $x^2 + kx + 1 = 0$ has the roots α and β, then what is the value of $(\alpha + \beta) \times (\alpha^{-1} + \beta^{-1})$

A. k^2

B. $\dfrac{1}{k^2}$

C. $2k^2$

D. $\dfrac{1}{(2k^2)}$

Answer: A

42. If the roots of $x^2 - bx + c = 0$ are two consecutive integers then $b^2 - 4c =$

A. 1

B. 2

C. -2

D. 3

Answer: A

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43. If r and s are roots of $x^2 + px + q = 0$, then what is the value of $(1/r^2) + (1/s^2)$?

A. $p^2 - 4q$

B. $\dfrac{p^2 - 4q}{2}$

C. $\dfrac{p^2 - 4q}{q^2}$

D. $\dfrac{p^2 - 2q}{q^2}$

Answer: D

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44. If x is an integar and satisfies $9 < 4x - 1 \leq 19$, then x is an element of the which one of the following sets?

    A. $\{3, 4\}$

    B. $\{2, 3, 4\}$

    C. $\{3, 4, 5\}$

    D. $\{2, 3, 4, 5\}$

Answer: C

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45. If $a = x + \sqrt{x^2 + 1}$, then what is x equal to?

    A. $(1/2)\left(a + a^{-1}\right)$

    B. $(1/2)\left(a - a^{-1}\right)$

    C. $a + a^{-1}$

D. $a - a^{-1}$

Answer: B

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46. A quadratic polynomial with two distinct roots has one real root. Then, the other root is

    A. not necessarily real, if the coefficients are real `

    B. always imaginary

    C. always real

    D. real, if the cosfficients are real

Answer: C

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47. If $\sin \alpha$ and $\cos \alpha$ are the roots of the equation $px^2 + qx + r = 0$, then which one of the following is correct ?

A. $p^2 + q^2 - 2pr = 0$

B. $p^2 - q^2 + 2pr = 0$

C. $(p + r)^2 = 2(p^2 + r^2)$

D. None of these

Answer: B

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48. If α and β are the roots of $x^2 + 4x + 6 = 0$, then what is the value of $\alpha^3 + \beta^3$?

A. $-2/3$

B. $2/3$

C. 4

D. 8

Answer: D

49. If sum of the roots of $3x^2 + (3p+1)x - (p+5) = 0$ is equal to their product, then what is the value of p?

A. 2

B. 3

C. 4

D. 9

Answer: A

50. If a polygon has 20 diagonals, then what is the number of sides ?

A. 6

B. 10

C. 12

D. 8

Answer: D

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51.   Let

α, γ be the roots of $Ax^2 - 4x + 1 = 0$ and β, δ be the roots of $Bx^2 -$

are in HP, then what are the values of Aand B respectively?

A. 3, 8

B. $-3, \ -8$

C. 3, -8

D. $-3, 8$

Answer: D

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52. If $2^x + 3^y = 17$ and $2^{x+1} - 3^{y+1} = 5$ then what is the value of x?

A. 3

B. 2

C. 1

D. 0

Answer: A

53. If $(x + a)$ is a factor of both the quadratic polynomials $x^2 + px + q$ and $x^2 + lx + m$, where p,q,l and m are constants, then which one of the following is correct?

A. $a = (m - q)/(l - p)(l \neq p)$

B. $a = (m - q)/(l + p)(l \neq -p)$

C. $l = (m - q)/(a - p)(a \neq p)$

D. $p = (m - q)/(a - l)(a \neq l)$

Answer: A

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54. Which one of the following is one of the roots of the equation $(b - c)x^2 + (c - a)x + (a - b) = 0$?

A. $(c - a)/(b - c)$

B. $(a - b)/(b - c)$

C. $(b - c) / (a - b)$

D. $(c - a) / (a - b)$

55. What is the vlaue of x satisfying the equation $16\left(\dfrac{a - x}{a + x}\right)^3 = \dfrac{a + x}{a - x}$?

A. $a / 2$

B. $a / 3$

C. $a / 4$

D. 0

56. If α, β are the roots of the equation $2x^2 - 2(1+n)^2 x + (1+n^2+n^4) = 0$ then what is the value of $\alpha^2 + \beta^2$?

A. $2n^2$

B. $2n^4$

C. 2

D. n^2

Answer: D

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57. The roots of $Ax^2 + Bx + C = 0$ are r and s. For the roots of $x^2 + px + q = 0$ to be r^2 and s^2, what must be the value of p?

A. $(B^2 - 4AC)/A^2$

B. $(B^2 - 2AC)/A^2$

C. $\left(2AC - B^2\right) / A^2$

D. $B^2 - 2C$

Answer: C

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58. If α, β are the roots of $ax^2 + bx + b = 0$ then what is $\dfrac{\sqrt{\alpha}}{\sqrt{\beta}} + \dfrac{\sqrt{\beta}}{\sqrt{\alpha}} + \dfrac{\sqrt{b}}{\sqrt{a}}$ equal to ?

A. 0

B. 1

C. 2

D. 3

Answer: A

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59. If the roots of $ax^2 + bx + c = 0$ are $\sin \alpha$ and $\cos \alpha$ for some α, then which one of the following is correct ?

A. $a^2 + b^2 = 2ac$

B. $b^2 - c^2 = 2ab$

C. $b^2 - a^2 = 2ac$

D. $b^2 + c^2 = 2ab$

Answer: C

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60. If $x = 2 + 2^{\frac{2}{3}} + 2^{\frac{1}{3}}$, then the value of $x^3 - 6x^2 + 6x$ is:

A. 1

B. 2

C. 3

D. -2

Answer: B

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61. The roots of the equation $(x - p)(x - q) = r^2$ where p,q , r are real , are

    A. always complex

    B. always real

    C. always purely imaginary

    D. None of these

Answer: B

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62. The equation $x - 2(x - 1)^{-1} = 1 - 2(x - 1)^{-1}$ has

A. no roots

B. One root is real and the other is complex

C. two equal roots

D. infinite roots

Answer: A

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63. If a,b and c are real numbers then the roots of the equation

$$(x - a)(x - b) + (x - b)(x - c) + (x - c)(x - a) = 0 \text{ are always}$$

A. real

B. imaginary

C. positive

D. negative

Answer: A

64. For the two equations $x^2 + mx + 1 = 0$ and $x^2 + x + m = 0$, what is the value of m for which these equations have at least one common root?

A. $-2 only$

B. $1 only$

C. -2 and 1

D. -2 and -1

Answer: C

65. Consider the equations $(x - p)(x - 6) + 1 = 0$ having integral coefficents. If the equation has integral roots, then what values can p have?

A. 4 or 8

B. 5 or 10

C. 6 or 12

D. 3 or 6

Answer: A

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66. If $\dfrac{1}{2 - \sqrt{-2}}$ is one of the roots of $ax^2 + bx + c = 0$, where a,b, c are real, then what are the values of a,b,c respectively ?

A. $6, \ -4, \ 1$

B. $4, \ 6, \ -1$

C. $3, \ -2, \ 1$

D. $6, \ 4, \ 1$

Answer: A

67. If α, β are the roots of the equation $x^2 - x + 1 = 0$ then which one of the following is correct?

A. $\left(\alpha^2 - \beta^2\right) is real$

B. $2\left(\alpha^6 + \beta^5\right) = (\alpha\beta)^5$

C. $\left(\alpha^6 - \beta^6\right) = 0$

D. $\left(\alpha^8 + \beta^8\right) = \left(\alpha\beta^8\right)$

Answer: C

68. If p and q are positive integers, then which one of the following equations has $p - \sqrt{q}$ as one of its roots ?

A. $x^2 - 2px - \left(p^2 - q\right) = 0$

B. $x^2 - 2px + (p^2 - q) = 0$

C. $x^2 + 2px - (p^2 - q) = 0$

D. $x^2 + 2px + (p^2 - q) = 0$

Answer: B

69. If the product of the roots of the equation $x^2 - 5x + k = 15$ is -3, then what is the value of k?

A. 12

B. 15

C. 16

D. 18

Answer: A

70. If the equation $x^2 - bx + 1 = 0$ does not possess real roots, then which one of the following is correct?

    A. $-3 < b < 3$

    B. $-2 < b < 2$

    C. $b > 2$

    D. $b < -2$

Answer: B

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71. If p and q are the root of the equation $x^2 - px + q = 0$, then what are the vlaues of p and q respectively ?

    A. $1, 0$

    B. $0, 1$

C. $-2, 0$

D. $-2, 1$

72. Determine the positive values of $'k'$ for which the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots.

A. 4

B. 8

C. 12

D. 16

73. If the roots of the equation

$$\left(a^2 + b^2\right)x^2 - 2b(a + c)x + \left(b^2 + c^2\right) = 0 \text{ are equal , then which one of}$$

the following is correct ?

A. $ab = a + c$

B. $b^2 = ac$

C. $b + c = 2a$

D. $b = ac$

Answer: B

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74. If α and β are the roots of the equation $x^2 - 2x + 4 = 0$, then what

is the value of $\alpha^3 + \beta^3$?

A. 16

B. -16

C. 8

D. -8

Answer: B

75. The imaginary roots of the equation $\left(x^2 + 2\right)^2 + 8x^2 = 6x\left(x^2 + 2\right)$ are

A. $1 \pm i$

B. $2 \pm i$

C. $1 \pm \sqrt{2}$

D. $2 \pm I\sqrt{2}$

Answer: A

76. If α and β are the roots of the equation $x^2 + x + 1 = 0$ then which of the following are the roots of the equation $x^2 - x + 1 = 0$?

A. α^2 and β^{13}

B. α^{13} and β^7

C. α^{20} and β^{20}

D. None of these

Answer: D

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77. What is the solution set for the equation $x^4 - 26x^2 + 25 = 0$

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

B. $\{-5, \ -1\}$

C. $\{1, 5\}$

D. $\{-5, 0, 1, 5\}$

Answer: A

78. If α and β are the roots of the equation $4x^2 + 3x + 7 = 0$, then what is the value of $\left(\alpha^{-2} + \beta^{-2}\right)$?

A. $47/49$

B. $49/47$

C. $-47/49$

D. $-49/47$

Answer: C

79. What is the set of points (x,y) satisfying the equations $x^2 + y^2 = 4$ and $x + y = 2?$

A. $\{(2, 0), (- 2, 0), (0, 2)\}$

B. $\{(0, 2), (0, - 2)\}$

C. $\{(0, 2), (2, 0)\}$

D. $\{(2, 0), (- 2, 0), (0, 2), (0, 2)\}$

Answer: C

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80. If p,q and r are rational numbers, then the roots of the equation

$x^2 - 2px + p^2 + 2qr - r^2 = 0$ are

A. complex

B. pure imaginary

C. irrational

D. rational

Answer: D

81. If p,q and r rational numbers, then the roots of the equation

$$\left(2 - \sqrt{3}\right)x^2 - \left(7 - 4\sqrt{3}\right)x + \left(2 + \sqrt{3}\right) = 0?$$

A. $2 - \sqrt{3}$

B. $2 + \sqrt{3}$

C. $7 - 4\sqrt{3}$

D. 4

Answer: A

82. What is the condition that one root of the equation $ax^2 + bx + c = 0 \quad a \neq 0$ should be double the other ?

A. $a > 0, b > 0, c > 0,$

B. $a > 0, b < 0, c > 0$

C. $a < 0, b > 0, c < 0$

D. $a < 0, c > 0$

Answer: B

83. What is the condition that one root of the equation $ax^2 + bx + c = 0 \quad a \neq 0$ should be double the other ?

A. $2a^2 = 9ac$

B. $2b^2 = 9ac$

C. $2c^2 = 9ab$

D. None of these

Answer: B

84. If $x + y \leq 4$, then the how many non- zero positive integar ordered pair (x,y)?

   A. 4

   B. 5

   C. 6

   D. 8

Answer: C

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85. If 3 is the root of the equation $x^2 = 8x + k = 0$ then what is the value of k?

   A. -15

   B. 9

C. 15

D. 24

Answer: C

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86. If sum of squares of the roots of the equation $x^2 + kx - b = 0$ is 2b,

what is k equal to ?

A. 1

B. b

C. $-b$

D. 0

Answer: D

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87. If one root of the equation $ax^2 + bx + c = 0, a \neq 0$ is reciprocal of the other root , then which one of the following is correct?

    A. $a = c$

    B. $b = c$

    C. $a = -c$

    D. $b = 0$

Answer: A

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88. The equation $x^2 - 4x + 29 = 0$ has one root 2+ 5i. What is the other root?

    A. 2

    B. 5

    C. $2 + 5i$

D. $2 - 5i$

89. Let α, β be 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, c (b) b, c a, b (d) $a + c$, $b + c$

A. a, c

B. b, c

C. a, b

D. $a + b$, $a + c$

90. If the equations $x^2 - px + q = 0$ and $x^2 - ax + b = 0$ have a common root and the second equation has equal roots then

A. $aq = 2(b + p)$

B. $aq = (b + q)$

C. $ap = 2(b + q)$

D. $ap = b + q$

Answer: C

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

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: B

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92. .The value of $\sqrt{8 + 2\sqrt{8 + 2\sqrt{8 + 2\sqrt{8 + 2\sqrt{8 + ...\infty}}}}}$ is equal to

A. 10

B. 8

C. 6

D. 4

Answer: D

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93. If $\sin\theta = x + \dfrac{a}{x}$ for all $x \in R - \{0\}$, then which one of the following is correct ?

A. $a \geq 4$

B. $a \geq \dfrac{1}{2}$

C. $a \leq \dfrac{1}{4}$

D. $a \leq \dfrac{1}{2}$

Answer: C

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94. The equation $\tan^4 x - 2\sec^2 x + a = 0$ will have at least one solution if `1

A. $|a| \leq 4$

B. $|a| \leq 2$

C. $|a| \leq \sqrt{3}$

D. None of the above

Answer: C

---

95. If the roots of the equation $x^2 - 4x - \log_3 N = 0$ are real, then what is the minimum vlaue of N?

A. $1/256$

B. $1/27$

C. $1/64$

D. $1/81$

Answer: D

96. If one of the roots of the equation $(b - c)x^2 + b(c - a)x + c(a - b) = 0$ is 1, what is the second root ?

A. $-\dfrac{b(c - a)}{a(b - c)}$

B. $\dfrac{b(c - a)}{a(b - c)}$

C. $\dfrac{c(a - b)}{a(b - c)}$

D. $\dfrac{c(a - b)}{a(b - c)}$

Answer: C

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97. What are the roots of the equation $2(y + 2)^2 - 5(y + 2) = 12$?

A. $-7/2, 2$

B. $-3/2, 4$

C. $-5/3, 3$

D. $3/2, 4$

Answer: A

98. If the roots of the equation $3x^2 - 5x + q = 0$ are equal , then what is the value of q ?

A. 2

B. $5/12$

C. $12/25$

D. $25/12$

Answer: D

99. If the difference between the roots of $ax^2 + bx + c = 0$ is 1, then which one of the following is correct ?

A. $b^2 = a(a + 4c)$

B. $a^2 = b(b + 4c)$

C. $a^2 = c(a + 4c)$

D. $b^2 = a(b + 4c)$

Answer: A

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100. If one of the roots of the equation $x^2 + ax - 6 = 0$ is 1, then what is (a-6) equal to ?

A. -1

B. 1

C. 2

D. -2

Answer: A

101. If α and β are the roots of the equation $x^2 - q(1+x) - r = 0$, then what is $(1+\alpha)(1+\beta)$ equal to ?

A. $1 - r$

B. $q - r$

C. $1 + r$

D. $q + r$

Answer: A

102. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

What is b:c equal to ?

A. $3:1$

B. $1:2$

C. $1:3$

D. $3:2$

Answer: A

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103. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

Which one of the following is correct ?

A. $bc = a^2$

B. $bc = 36a^2$

C. $bc = 72a^2$

D. $bc = 108a^2$

Answer: D

---

104. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

What is the sum of the squares of the roots of the equation $x^2 + 2x - 143 = 0$

A. 170

B. 180

C. 190

D. 290

Answer: D

105. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

The solution of the simultaneous linear equaitons $2x + y = 6$ and $3y = 8 + 4x$ will also be satisfied by which one of the following linear equations ?

A. $x + y = 5$

B. $2x + y = 5$

C. $2x - 3y = 10$

D. $2x + 3y = 6$

Answer: A

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106. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If the roots of a quadratic equation are $m + n$ and $m - n$, then the quadratic equaiton will be :

A. $x^2 + 2mx + m^2 - mn + n^2 = 0$

B. $x^2 + 2mx + (m - n)^2 = 0$

C. $x^2 + 2mx + m^2 - n^2 = 0$

D. $x^2mx + m^2 - n^2 = 0$

Answer: C

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107. If α, β are the roots of $x^2 + px - q = 0$ and $\lambda, \delta x^2 + px - q = 0$ and λ, δ are the roots of $x^2 -$

equal to ?

A. $p + r$

B. $p + q$

C. $q + r$

D. $p - q$

Answer: C

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108. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If the roots of the quadratic equation $3x^2 - 5x + p = 0$ and unequal , then which one of the following is correct ?

A. $p = 25/12$

B. $p < 25/12$

C. $p > 25/12$

D. $p \leq 25/12$

Answer: B

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109. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If $4^x - 6.2^x 8 = 0$, then the values of x arre

A. 1, 2

B. 1, 1

C. 1, 0

D. 2, 2

Answer: A

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110. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If the roots of a quadratic equation $ax^2 + bx + c = 0$ are α and β, then the quadratic equation having roots α and β is

A. $x^2 - (b^2 - 2ac)x + c = 0$

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

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

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

Answer: D

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111. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If the roots of the equation $3ax^2 + 2bx + c = 0$ are in the ratio 2:3 , then which one of the following is correct ?

A. $8ac = 25b$

B. $8ac = 9b^2$

C. $8b^2 = 9ac$

D. $8b^2 = 25ac$

Answer: D

---

112. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If the sum of the roots of a quadratic equation is 3 and the product is 2, then the equationis

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

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

C. $x^2 + 3x + 2 = 0$

D. $x^2 - 3x - 2 = 0$

Answer: B

113. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If α and β are the roots of the equation $x^2 + bx + c = 0$, then what is the value of $\alpha^{-1} + \beta^{-1}$?

A. $-\dfrac{b}{c}$

B. $\dfrac{b}{c}$

C. $\dfrac{c}{b}$

D. $-\dfrac{c}{b}$

Answer: A

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114. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

The area of a rectangle whose length is five more than twice its width is 75 square unit. The length is

A. 5 unit

B. 10 unit

C. 15 unit

D. 20 unit

Answer: C

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115. The equation formed by multiplying each root of

$ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

$(x + 1)^2 - 1 = 0$ has

A. one real root

B. two real roots

C. two imaginary roots

D. four real roots

Answer: B

---

116. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

What is the positive square root of $7 + 4\sqrt{3}$?

A. $\sqrt{3} - 1$

B. $\sqrt{3} + 1$

C. $\sqrt{3} + 2$

D.

Answer: D

117. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

If α and β are the roots of the equation $x^2 + x + 2 = 0$, then what is $\dfrac{\alpha^{10} + \beta^{10}}{\alpha^{-10} + \beta^{-10}}$ equal to ?

A. 4096

B. 2048

C. 1024

D. 512

Answer: C

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118. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

How If a and b are rational and b is not perfect square, then the

quadratic equaiton with rational coefficients whose one root is $3a + \sqrt{b}$ is

A. $x^2 - 6ax + 9a^2 - b = 0$

B. $3ax^2 + x - \sqrt{b} = 0$

C. $x^2 + 3x + \sqrt{b} = 0$

D. $\sqrt{b}x^2 + x - 3a = 0$

Answer: A

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119. How many real roots does the quadratic equation $f(x) = x^2 + 3|x| + 2 = 0$ have ?

A. One

B. Two

C. Fore

D. No real root

Answer: D

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120. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

IF α, β are the roots does the quadratic equation $ax^2 + bx + b = 0$ then what is the value of $\sqrt{\dfrac{\alpha}{\beta}} + \sqrt{\dfrac{\beta}{\alpha}} + \sqrt{\dfrac{b}{a}}$?

A. -1

B. 0

C. 1

D. 2

Answer: B

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121. The roots of the equation $x^2 - 8x + 16 = 0$

A. are imaginary

B. are distinct and real

C. are equal and real

D. canot be ascertained

Answer: C

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122. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

A. 2

B. 3

C. 5

D. 8

Answer: D

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123. The equation formed by multiplying each root of $ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$ $(x+1)^2 - 1 = 0$ has

A. 10

B. 11

C. 12

D. 13

Answer: A

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124. The equation formed by multiplying each root of

$ax^2 + bx + c = 0$ by 2 is $x^2 = 36x + 24 = 0$

$(x + 1)^2 - 1 = 0$ has

A. $b \leq - 4 only$

B. $b \geq only$

C. $- 4 < b < 4$

D. $b \leq - 4, b \geq 4$

Answer: D

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125. If α and β are the roots of the equation $ax^2 + bx + c = 0$ where α 0 then $(a\alpha+b)(a\beta+b)$ is equal to

A. ab

B. bc

C. ca

D. abc

Answer: C

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126. The roots of the equation $2a^2x^2 - 2abx + b^2 = 0$ when a < 0 and b > 0 are :

A. Sometimes complex

B. Always irrational

C. Always complex

D. Always real

Answer: C

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127. Every quadratic equation

$$ax^2 + bx + c = 0, \quad \text{where} \quad a, b, c \in R \text{ has`}$$

A. exactly one real root.

B. at least one rea root.

C. at least two real roots.

D. at most two real roots.

Answer: D

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128. If α , β are the roots of $ax^2 + bx + c = 0$ and $a + h$, β+h are the roots of $px^2 + qx + r = 0$ then what is h equal to ?

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

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

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

D. $\dfrac{1}{2}\left(-\dfrac{b}{p}+\dfrac{q}{a}\right)$

Answer: A

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129. Consider the following statements in respect of the given equation

$$\left(x^2+2\right)^2+8x^2=6x\left(x^2+2\right)$$

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: B

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130. Two students solved a problem involving a quadratic equation. The first student made an error only in the constant term of the equation and determined the roots were 2 and 8. The second student made an error only in the coefficient of the linear term and determined the roots were -1 and -9. What was the quadratic equation ?

A. $x^2 - 10x + 9 = 0$

B. $x^2 - 10x + 9 = 0$

C. $x^2 - 10x + 16 = 0$

D. $x^2 - 8x - 9 = 0$

Answer: A

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131. If m and n are roots of the equation (x+p)(x+q)-k=0 then find the roots of the equation (x-m)(x-n)+k=0

A. p and q

B. $\dfrac{1}{p}$ and $\dfrac{1}{q}$

C. $-p$ and $-q$

D. $p + q$ and $p - q$

Answer: C

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132. 2p+3q=18 and $4p^2 + 4pq - 3q2 - 36 = 0$ then what is (2p+q) equal to?

A. 6

B. 7

C. 10

D. 20

Answer: C

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133. The number of real roots of the equation $x^2 - 3\mod x + 2 = 0$ is

A. 4

B. 3

C. 2

D. 1

Answer: A

134. If the sum of the roots of the equation $ax^2 + bx + c = 0$ is equal to the sum of their squares then

A. $a^2 + b^2 = c^2$

B. $a^2 + b^2 = a + b$

C. $ab + b^2 = 2ac$

D. $ab - b^2 = 2ac$

Answer: C

135. If the roots of the equation $x^2 - nx + m = 0$ differ by 1 then

A. $n^2 - 4m - 1 = 0$

B. $n^2 + 4m - 1 = 0$

C. $m^2 - 4n - 1 = 0$

D. $m^2 - 4n - 1 = 0$

Answer: A

136. If $x^2 - px + 4 > 0$ for all real value of x,then which one of the following is correct ?

A. $|p| < 4$

B. $|p| \leq 4$

C. $|p| > 4$

D. $|p| \geq 4$

Answer: B

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137. Consider the function $f(x) = 27\dfrac{x^{\frac{2}{3}} - x}{4}$ How many solutions does the function f(x) =1 have?

A. One

B. Two

C. Three

D. Four

Answer: B

---

138. Consider the function $f(x) = 27\dfrac{x^{\frac{2}{3}} - x}{4}$ How many solutions does the function f(x) =1 have?

A. One

B. Two

C. Three

D. Four

Answer: A

139. Let

α and $\beta(a < \beta)$ be the roots of the equation $x^2 + bx + c = 0$, where b

Consider the following : 1. $\beta < -\alpha$ 2. $\beta < |a|$

Which of the above is//are corect ?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: C

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140. Let

α and $\beta(a < \beta)$ be the roots of the equation $x^2 + bx + c = 0$, where b

Consider the following :

1. $\alpha + \beta + \alpha\beta > 0$

2. $\alpha^2\beta + \beta^2\alpha > 0$

Which of the above is//are correct ?

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: B

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141.   Let

α and $\beta(a < \beta)$ be the roots of the equation $x^2 + bx + c = 0$, where b

If one root of the equation $(1 - m)x^2 + 1x + 1 = 0$ is double the other

and 1 is real , then what is the greatest value of m?

A. $-\dfrac{9}{8}$

B. 43716

C. $-\dfrac{8}{9}$

D. $\dfrac{8}{9}$

Answer: B

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142. If $c > 0$ and $4a + c < 2b$ then $ax^2 - bx + c = 0$ has a root win

which one of the following intervals a)(0,2) b)(2,3) c)(3,4) d)(-2,0)

A. $(0, 2)$

B. $(2, 3)$

C. $(3, 4)$

D. $(-2, 0)$

Answer: A

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143. Let

α and $\beta(\alpha < \beta)$ be the roots of the equation $x^2 + bx + c = 0$, where b

If both the roots of the equation $x^2 - 2kx + k^2 - 4 = 0$ lie between

-3 and 5, then which one of the following is correct ?

A. $-2 < k < 2$.

B. $-5 < k < 3$

C. $-3 < k < 5$

D. $-1 < k < 3$

Answer: D

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144. Let α and β be the roots of equation

$x^2 - (1 - 2a^2)x + (1 - 2a^2) = 0$ 1.) under what condition does the

above equation have real roots. 1.) $a^2 < \dfrac{1}{2}$ 2.) $a^2 > \dfrac{1}{2}$ 3.) $a^2 \leq \dfrac{1}{2}$ 4.)

$a^2 \geq \dfrac{1}{2}$ 2.) Under what condition is $\dfrac{1}{(\alpha)^2} + \dfrac{1}{(\beta)^2} < 1$?

A. $a^2 < \dfrac{1}{2}$

B. $a^2 > \dfrac{1}{2}$

C. $a^2 \le \dfrac{1}{2}$

D. $a^2 \ge \dfrac{1}{2}$

Answer: D

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145. Let α and β be the roots of the equation

$$x^2 - \left(1 - 2a^2\right)x + \left(1 - 2a^2\right) = 0$$

Under what condition is $\dfrac{1}{\alpha^2} + \dfrac{1}{\beta^2} < 1$?

A. $a^2 < \dfrac{1}{2}$

B. $a^2 > \dfrac{1}{2}$

C. $a^2 > 1$

D. $a^2 \in \left(\dfrac{1}{3}, \dfrac{1}{2}\right)$ omly

Answer: A

---

146. What is the greatest value of the positive integer n satisfying the condition $1 + \dfrac{1}{2} + \dfrac{1}{4} + \dfrac{1}{8} + \,..... \,+ \dfrac{1}{2^{n-1}} < 2 - \dfrac{1}{1000}$?

A. 8

B. 9

C. 10

D. 11

Answer: C

147.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx$

What is the valueof α?

A. $1/2$

B. 1

C. 2

D. 4

Answer: C

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148.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx -$

If $\beta, 2, 2m$ are in GP, then what is the value of $\beta\sqrt{m}$?

A. 1

B. 2

C. 4

D. 6

Answer: A

149. $If the p \phi(a, a) lies between the l \in es$ |x + y| = 2 ,` then which one of the following is correct ?

A. $|a| < 2$

B. $|a| < \sqrt{2}$

C. $|a| < 1$

D. $|a| < \dfrac{1}{\sqrt{2}}$

Answer: C

150.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx$

If the roots of the equation $x^2 + px + q = 0$ are in the same ratio as those of the equation $x^2 + lx + m = 0$, then which one of the following is correct ?

A. $p^2 m = l^2 q$

B. $m^2 p = l^2 p$

C. $m^2 p = q^2 l$

D. $m^2 p^2 = l^2 q$

Answer: A

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151.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx$

If ω, ω^2 are the cube roots of unity, then $(1+\omega)\left(1+\omega^2\right)\left(1+\omega^3\right)\left(1+\omega+\omega^2\right)$ is equal to

A. -2

B. -1

C. 0

D. 2

Answer: C

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152.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx -$

If the graph of a quadratic polynomial lies entirely above x-axis, then

which one of the following is correct ?

A. Both the roots are real

B. One root is real and the other is complex

C. Both the roots are complex

D. Cannot say

Answer: C

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153.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx$ –

If cot α and cot β are the roots of the equation

$x^2 + bx + c = 0$ with $b \neq 0$, then the value of cot$(\alpha + \beta)$ is

A. $\dfrac{c - 1}{b}$

B. $\dfrac{1 - c}{b}$

C. $\dfrac{b}{c - 1}$

D. $\dfrac{b}{1 - c}$

Answer: B

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154.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx -$

The roots of the equation

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

A. $(r - p)/(q - r), 1/2$

B. $(p - q)/(q - r), 1$

C. $(q - r)/(p - q), 1$

D. $(r - p)/(p - q), 1/2$

Answer: B

155.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx -$

If α and β are the roots of the equation $1 + x + x^2 = 0$, then the matrix product $\begin{bmatrix} 1 & \beta \\ \alpha & \alpha \end{bmatrix}, \begin{bmatrix} \alpha & \beta \\ 1 & \beta \end{bmatrix}$ is equal to

A. $\begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$

B. $\begin{bmatrix} -1 & -1 \\ -1 & 2 \end{bmatrix}$

C. $\begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix}$

D. $\begin{bmatrix} -1 & -1 \\ -1 & -2 \end{bmatrix}$

Answer: B

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156. $If |a|$

$de \neg esthe|o|lutevalueofan \int egar, then which of the follow \in garec$ or $rec\bar{e}$

$|ab| = |\,a\,|\,|\,b\,|$ 2. $|a + b|$ le $|a| + |\,b|$ 3. $|a\text{-}b|$ ge $|a|$ - $|b|$ $|\,|$` Select the correct answer using the code given below.

A. 1 and 2 only

B. 2 and 3 only

C. 1 and 3 only

D. 1,2 and 3

Answer: D

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157.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx -$

The sum of all real roots of the equation $|x - 3|^2 + |x - 3| - 2 = 0$ is

A. 2

B. 3

C. 4

D. 6

Answer: D

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158.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx -$

It is given that the roots of the equation $x^2 - 4x - \log_3 P = 0$ are real .

For this, the minimum value of P is

A. $\dfrac{1}{27}$

B. $\dfrac{1}{64}$

C. $\dfrac{1}{81}$

D. 1

Answer: C

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159.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx -$

If α and β are the roots of the equation $3x^2 + 2x + 1 = 0$, then the equation whose roots are $\alpha + \beta^{-1}$ and $\beta + \alpha^{-1}$

A. $3x^2 + 8x + 16 = 0$

B. $3x^2 - 8x - 16 = 0$

C. $3x^2 + 8x - 16 = 0$

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

Answer: A

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160.

$2x^2 + 3x - a - 0$ has roots -2 and β while the equation $x^2 - 3mx$ $\Delta PQR, \angle R = \frac{\pi}{2}$. If than $\left(\frac{P}{2}\right)$ and $\tan\left(\frac{Q}{2}\right)$ are the roots of the equ then which one of the following is correct ?

A. $a = b + c$

B. $b = c + a$

C. $c = a + b$

D. $b = c$

Answer: C

161.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx$ —

The equation $|1 - x| + x^2 = 5$ has

A. a rational root and an irrational root

B. two rational roots

C. two irrational roots

D. no real roots

Answer: A

162.

$2x^2 + 3x - \alpha - 0$ has roots -2 and β while the equation $x^2 - 3mx$

Let $[x]$ denote the greatest integar function. What is the number of

solutions of the equation $x^2 - 4x + [x] - 0$ in the interval $[0, 2]$?

A. Zero (No solution)

B. One

C. Two

D. Three

Answer: B

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163. $Consider the follow \in g \exp ressions :$ 1. x+x^(2)- 1/x2. sqrt(ax^(2) +

bx + x - c + d/c - e / x^(2))3. 3x^(2) - 5 x + ab51/x - 2/ (x+5)` Which of the

above are rational expressions ?

A. 1, 4 and 5*only*

B. 1, 3, 4 and 5*only*

C. 2, 4 and 5*only*

D. 1 and 2*only*

Answer: B

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164. If α and $\beta (\neq 0)$ are the roots of the quadratic equation $x^2 + ax - \beta = 0$, then the quadratic expression $-x^2 + ax + \beta$ where has

A. Least value $-\dfrac{1}{4}$

B. Least value $-\dfrac{9}{4}$

C. Greatest value $\dfrac{1}{4}$

D. Greatest value $\dfrac{9}{4}$

Answer: D

---

165. Let f(x) be a quadratic expression which is positive for all ral x and

g(x) = f(x) + f'(x) + f"(x), then for any real x,

A. $g(x) < 0$

B. $g(x) > 0$

C. $g(x) = 0$

D. $g(x) \leq 0$

Answer: B

---

166. The ration of roots of the equations $ax^2 + bx + c = 0$ and px^(2) +

qx + r = 0 are equal. If D_1 and D_2 are respective discriminates. Then

what is $\dfrac{D_1}{D_2}$ equal to ?

A. $\dfrac{a^2}{p^2}$

B. $\dfrac{b^2}{q^2}$

C. $\dfrac{c^2}{r^2}$

D. None of these

Answer: B

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

A. $-2, 1, 4$

B. $0, 2, 4$

C. $0, 1, 4$

D. $-2, 2, 4$

Answer: B

168. The equation $Px^2 + qx + r = 0$ (where p, q, r, all are positive) has distinct real roots a and b .

A. $a > 0, b > 0$

B. $a < 0, b < 0$

C. $a > 0, b < 0$

D. $a < 0, b > 0$

Answer: D

169. If the roots of the equation $x^2 + px + q = 0$ are $x^2 + px + q = 0$ are $\tan 19°$ and $\tan 26°$, then which one of the following is correct ?

A. $q - p = 1$

B. $p - q = 1$

C. $p + q = 2$

D. $p + q = 3$

Answer: A

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170. The number of real roots for the eqiuation $x^2 + 9|x| + 20 = 0$ is

A. Zero

B. One

C. Two

D. Three

Answer: B

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