MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

QUADRATIC EXPRESSIONS

Solved Examples

1. The roots of the equation $6\sqrt{5}x^2 - 9x - 3\sqrt{5} = 0$ is

A. $\sqrt{5}/2\sqrt{5}/5$

B. $-\sqrt{5}/2\sqrt{5}/5$

C. $\sqrt{5}/2, \ -\sqrt{5}/5$

D. $-\sqrt{5}/2, \ -\sqrt{5}/5$

Answer: C

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2. IF the product of the roots of the equation $x^2 - 3kx + 2e^{2\log k} - 1 = 0$ is 17 then K=

A. 5

B. 3

C. 2

D. 9

Answer: B

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3. IF the different between the roots of $x^2 - px + q = 0$ is 2, then the relation between p , and q is

A. $p = 4(q + 1)^2$

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

C. $p^2 = 4(q + 1)$

D. $p = 4(q + 1)$

Answer: C

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4. if the equation $(3x)^2 + \left(27 \times 3^{1/p} - 15\right)x + 4 = 0$ has equal roots then p=

A. 0

B. 2

C. $-1/2$

D. none

Answer: C

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5. IF $2 + \sqrt{3}$ is a root of the equation $x^2 + px + q = 0$ then

A. $p = -6, q = 13$

B. $p = -6, q = 14$

C. $p = -4, q = 1$

D. $p = -8, q = 25$

Answer: C

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6. The number of solutions of the equation $\left|x^2\right| - 3|x| + 2 = 0$ is

A. 4

B. 1

C. 3

D. 2

Answer: A

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7. Solve $4^{x-1} - 3.2^{x-1} + 2 = 0$

A. $\{1, 2\}$

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

C. $\{1, 5\}$

D. $\{4, -1\}$

Answer: A

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8. The minimum value of $3x^2 + 2x + 11$ is

A. 32

B. $32/3$

C. 2

D. 3

Answer: B

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9. The solution set of $x^2 - 8x + 15 > 0$ is

A. $(-1, 4)$

B. $(-\infty, -3] \cup [7, \infty)$

C. $(-\infty, 3) \cup, (5, \infty)$

D. $[-4, 1]$

Answer: C

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10. The range of $\dfrac{x^2 - 2x + 3}{x^2 - 2x - 8}$ is

A. $(-\infty, 0] \cup (1, \infty)$

B. $[1/2, 2]$

C. $(-\infty, -2/9] \cup (1, \infty)$

D. $(-\infty, -6] \cup [-2, \infty)$

Answer: C

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11. IF p,q, $\in$ { 1,2,3.4} the number of equation of the form $px^2 + qx + 1 = 0$ having real roots is

A. 15

B. 9

C. 7

D. 8

Answer: C

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

A. $(0, \infty)$

B. $(-\infty, 0)$

C. $(0, 1)$

D. $(1, \infty)$

Answer: C

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13. IF α and β be the roots of the equation $x^2 + px - \frac{1}{2p^2} = 0$ where $p \in R$, then the minimum value of $\alpha^4 + \beta^4 =$

A. $2 + \sqrt{2}$

B. 2

C. $2\sqrt{2}$

D. $2 - \sqrt{2}$

Answer: A

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14. Sum of the non real roots of $\left(X^2 + x - 2\right)\left(x^2 + x - 3\right) = 12$ is

A. -1

B. 1

C. -6

D. 6

Answer: A

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15. if $x^2 + 3x + 5 = 0$ and $ax^2 + bx + c = 0$ have common roots / roots and and a,b,c $\in$ N , then the minimum value of $a + b + c$ is

A. 9

B. -9

C. 3

D. -3

Answer: A

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16. if $c > 0$ and $4a + c < 2b$ then $ax^2 - bx + c = 0$ has a root in the interval

A. $(2, 4)$

B. $(0, 2)$

C. $(0, 1)$

D. $(-2, 0)$

Answer: B

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17. If a=c=4b , then the roots of $ax^2 + 4bx + c = 0$ are

A. $1, \frac{c}{a}$

B. $-1, \frac{c}{a}$

C. $-1, -\frac{c}{a}$

D. $1, -\frac{c}{a}$

Answer: C

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18. IF the equation $ax^2 + 2bx + 3c = 0$ and $3x^2 + 8x + 15 = 0$ have a common root , where a,b,c are the length of the sides of a ΔABC , then $\sin^2 A + \sin^2 B + \sin^2$C=

A. 1

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

C. $\sqrt{2}$

D. 2

Answer: D

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19. IF both the roots of equation $x^2 - 2ax + a^2 - 1 = 0$ lie in the interval $(-3, 4)$, then sum of the integral of a is

A. 0

B. 2

C. 4

D. 1

Answer: A

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Exercise 1 A Quadratic Equations

1. If a, b are the roots of $x^2 + x + 1 = 0$ then $a^2 + b^2 =$

A. 1

B. 2

C. - 1

D. 4

Answer: C

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2. IF α, β are the roots of x^2 - $x + 2 = 0$ then $\alpha^2\beta + \alpha\beta^2$ =

A. 5

B. 3

C. -2

D. 2

Answer: D

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3. If α, β are the roots of $3x^2 - 5x + 7 = 0$ then $\alpha^3 + \beta^3 =$

A. $90/7$

B. $-120/17$

C. $170/23$

D. $-190/27$

Answer: D

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4. IF α, β are the roots of $ax^2 + bx + c = 0$ then $\alpha^2 + \beta^2 =$

A. $\frac{(b^2 - 2ac)}{a^2}$

B. $-\frac{b}{c}$

C. $\frac{(b^2 - 2ac)}{c^2}$

D. $\frac{(b^2 - 2ac)}{ac}$

Answer: A

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5. If α, β are the roots of $ax^2 + bx + c = 0$ then $\alpha\beta^2 + \alpha^2\beta + \alpha\beta =$

A. $\dfrac{ac - bc}{a^2}$

B. $\dfrac{bc - ac}{a^2}$

C. $\dfrac{ac - bc}{b^2}$

D. $\dfrac{bc - ac}{b^2}$

Answer: A

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6. If α, β are the roots of $x^2 + x + 1 = 0$ then $\alpha/\beta + \beta/\alpha =$

A. - 1

B. 1

C. 2

D. none

Answer: A

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7. IF α, β are the roots of $ax^2 + bx + c = 0$ then $\frac{1}{\alpha^2} + \frac{1}{\beta^2} =$

A. 1

B. -1

C. 2

D. $p/q-2$

Answer: B

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8. IF α, β are the roots of $ax^2+bx+c=0$ then $\frac{1}{\alpha^2}+\frac{1}{\beta^2}=$

A. $\frac{\left(b^2-2ac\right)}{a^2}$

B. $-\frac{b}{c}$

C. $\frac{\left(b^2-2ac\right)}{c^2}$

D. $\dfrac{\left(b^2 - 2ac\right)}{ac}$

Answer: C

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9. IF α, β are the roots of $ax^2 + bx + c = 0$ then $\alpha^3 + \beta^3 =$

A. $\dfrac{3abc - b^3}{a^3}$

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

C. $\dfrac{\left(b^2 - 2ac\right)}{c^2}$

D. $\dfrac{\left(b^2 - 2ac\right)}{ac}$

Answer: A

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10. IF α, β are the roots of $ax^2 + bx + c = 0$ then $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$

A. $\frac{3abc - b^3}{a^3}$

B. $\frac{3abc - b^3}{a^2c}$

C. $\frac{b^2 - 2ac}{c^2}$

D. $\frac{b^2 - 2ac}{ac}$

Answer: B

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11. IF α, β are the roots of $ax^2 + bx + c = 0$ then $\dfrac{1}{\alpha^3} + \dfrac{1}{\beta^3} =$

A. $\dfrac{3abc - b^3}{a^3}$

B. $\dfrac{3abc - b^3}{a^2c}$

C. $\dfrac{3abc - b^3}{c^3}$

D. $\dfrac{b^2 - 2ac}{ac}$

Answer: C

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12. If α, β are the roots of $ax^2 + bx + c = 0$ then $\alpha^5\beta^8 + \alpha\beta^5 =$

A. $\dfrac{c^5(3abc - b^3)}{a^8}$

B. $\dfrac{c^3(3abc - b^3)}{a^3}$

C. $\dfrac{a^2(3abc - b^3)}{c^3}$

D. $\dfrac{a^3(3abc - b^3)}{c^3}$

Answer: A

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13. IF α, β are the roots of $ax^2 + bx + c = 0$ then

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

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

B. $\dfrac{3abc - b^3}{a^2c}$

C. $\dfrac{3abc - b^3}{c^3}$

D. $\dfrac{b^2 - 2ac}{ac}$

Answer: A

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14. IF α, β are the roots of $ax^2 + bx + c = 0$ then $\dfrac{\alpha^3 + \beta^3}{\alpha^{-3} + \beta^{-3}}$ =

A. $\dfrac{c^2}{d^2}$

B. $\dfrac{c^3}{a^3}$

C. $\dfrac{3abc - b^3}{c^3}$

D. $\dfrac{b^2 - 2ac}{ac}$

Answer: B

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15. IF α, β are the roots of $ax^2 + bx + c = 0$ then $\left(\dfrac{\alpha}{\beta} - \dfrac{\beta}{\alpha}\right)^2 =$

A. $\dfrac{b^2\left(b^2 - 4ac\right)}{c^2a^2}$

B. $\dfrac{b^2\left(b^2 - 4ac\right)}{ca^3}$

C. $\dfrac{b^2\left(b^2 - 4ac\right)}{a^4}$

D. $\dfrac{b^2\left(b^2 - 4ac\right)}{c^4}$

Answer: A

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16. IF α, β are the roots of $ax^2 + bx + c = 0$ then

$$\left(\frac{1}{\alpha^2} - \frac{1}{\beta^2}\right)^2 =$$

A. $\dfrac{b^2\left(b^2 - 4ac\right)}{c^2a^2}$

B. $\dfrac{b^2\left(b^2 - 4ac\right)}{ca^3}$

C. $\dfrac{b^2\left(b^2 - 4ac\right)}{a^4}$

D. $\dfrac{b^2\left(b^2 - 4ac\right)}{c^4}$

Answer: D

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17. IF α, β are the roots of $ax^2 + bx + c = 0$ then $(a\alpha + b)^{-2} + (a\beta + b)^{-2}$=

A. $\dfrac{b^2 - 2ac}{a^4}$

B. $\dfrac{b^2 - 2ac}{a^3c}$

C. $\dfrac{b^2 - 2ac}{a^2c^2}$

D. $\dfrac{b^2 - 2ac}{c^4}$

Answer: C

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18. IF α, β are the roots of $ax^2 + bx + c = 0$ then $(a\alpha + b)^{-3} + (a\beta + b)^{-3} =$

A. $a^3 - 2abc$

B. $b^3 - 3abc$

C. $\frac{c^3 - 3abc}{b^3c^3}$

D. $\frac{b^3 - 3abc}{a^3c^3}$

Answer: D

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19. IF α, β are the roots of $ax^2 + bx + c = 0$ then

$$\left(\frac{\alpha}{a\beta + b}\right)^3 - \left(\frac{\beta}{a\alpha + b}\right)^3 =$$

A. 0

B. 1

C. $(a + b)^2$

D. $(a - b)^2$

Answer: A

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20. IF $\alpha, , \beta$ are the roots of the equation $8x^2$ - $3x + 27 = 0$

then the value of $\left(\frac{\alpha^2}{\beta}\right)^{1/3} + \left(\frac{\beta^2}{\alpha}\right)^{1/3}$ is

A. $1/3$

B. $1/4$

C. $7/2$

D. 4

Answer: B

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21. If α, β are the roots of $ax^2 + bx + c = 0$ then $\left(1 + \alpha + \alpha^2\right)\left(1 + \beta + \beta^2\right)$ is

A. zero

B. positive

C. negative

D. not determined

Answer: B

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22. If α, β are the roots of $ax^2 - 2bx + c = 0$ then $\alpha^3\beta^3 + \alpha^2\beta^3 + \alpha^3\beta^2 =$

A. $\dfrac{c^2(2b+c)}{a^3}$

B. $\dfrac{bc^2}{a^3}$

C. $\dfrac{c^3}{a^3}$

D. $\dfrac{c^2(b+2ac)}{a^3}$

Answer: A

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23. IF α, β are real and $\alpha^2, -\beta^2$ are the roots of $a^2x^2 + x + 1 - a^2 = 0 (A > 1)$ then $\beta^2 =$

A. a^2

B. 1

C. $1 - a^2$

D. $1 + a^2$

Answer: B

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24. If α, β are the roots of $x^2 - 2x + 4 = \; - 0$ then $\alpha^5 + \beta^5$=

A. 8

B. 16

C. 32

D. 64

Answer: C

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25. If α and β are the roots of the equation $x^2 - 2x + 4 = 0$, then $\alpha^9 + \beta^9 =$

A. -2^8

B. 2^9

C. -2^{10}

D. 2^{10}

Answer: C

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26. Let α and β be the roots of equation $px^2 + qx + r = 0, p \neq 0,$ if p,q, r are in A.P and $\frac{1}{\alpha} + \frac{1}{\beta} = 4$ then the value of $|\alpha - \beta|$ is

A. $\frac{\sqrt{34}}{9}$

B. $\frac{2\sqrt{13}}{9}$

C. $\frac{\sqrt{61}}{9}$

D. $\frac{2\sqrt{17}}{9}$

Answer: B

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27. IF α, β be the roots of $6x^2 - 6x + 1 = 0$ then

$$\frac{1}{2}\left(a + ba + c\alpha^2 + d\alpha^3\right) + \frac{1}{2}\left(a + b\beta + c\beta^2 + d\beta^3\right) =$$

A. $a + \beta + c + d$

B. $a + 2b + 3c + 4d$

C. $a + b/2 + c/3 + d/4$

D. none

Answer: C

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28. If α, β are the roots of $x^2 - p(x + 1) + c = 0$ then

$(1 + \alpha)(1 + \beta) =$

A. 1

B. c

C. $1 - c$

D. $1 + c$

Answer: D

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29. IF α, β are the roots of $x^2 - p(x + 1) - c = 0$ then

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

A. 3

B. 2

C. 1

D. 0

Answer: C

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30. IF α, β are the roots of $ax^2 + bx + c = 0$ and

$s_n = \alpha^n + \beta^n$ then $\begin{vmatrix} 3 & 1 + S_1 & 1 + S_2 \\ 1 + S_1 & 1 + S_2 & 1 + S_3 \\ 1 + s_2 & 1 + s_3 & 1 + S_4 \end{vmatrix}$ =

A. 0

B. $\dfrac{\left(b^2 - 4ac\right)(a + b + c)^2}{a^4}$

C. $\dfrac{b^2 - 4ac}{a^4}$

D. $\dfrac{(a + b + c)^2}{a^4}$

Answer: B

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31. Let α and β be the roots of equation $x^2 - 6x - 2 = 0$. If $a_n = \alpha^n - \beta^n$, for $n \geq 1$ then the value of $\dfrac{a_{10} - 2a_s}{2a_9}$ is equal to

A. 6

B. -6

C. 3

D. -3

Answer: C

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32. IF α, β are the roots of the equation $ax^2 + bx + c = 0$, then the value of the determinant

$$\begin{vmatrix} 1 & \cos(\beta - \alpha) & \cos\alpha \\ \cos(\alpha - \beta) & 1 & \cos\beta \\ \cos\alpha & \cos\beta & 1 \end{vmatrix}$$

A. $\sin(\alpha + \beta)$

B. $\sin\alpha\sin\beta$

C. $1 + \cos(\alpha + \beta)$

D. 0

Answer: D

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33. 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. 0

B. 1

C. 2

D. 3

Answer: D

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34. IF $\tan A, \tan B$ are the roots of $x^2 - px + q = 0$, the value of $\sin^2(A + B)$ is

A. $\dfrac{p^2}{p^2 + (1 - q)^2}$

B. $\dfrac{p^2}{p^2 + q^2}$

C. $\dfrac{q^2}{p^2 + (1 - q)^2}$

D. $\dfrac{p^2}{(p + q)^2}$

Answer: A

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35. If α, β are the roots of $x^2 + ax - b = 0$ and γ, σ are the roots of $x^2 + ax + b = 0$ then $(\alpha - \gamma)(\beta - \gamma)(\alpha - \sigma)(\beta - \sigma) =$

A. b^2

B. $2b^2$

C. $3b^2$

D. $4b^2$

Answer: D

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36. If α, β are the roots of $x^2 + px - q = 0$ and γ, δ are the roots of $x^2 + px + r = 0$ then $(\alpha - \gamma)(\beta - \gamma)(\alpha - \delta)(\beta - \delta) =$

A. $2q^2$

B. $2q^2$

C. $(q + r)^2$

D. $(q - r)^2$

Answer: C

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37. If α, β are the roots of $x^2 + px + 1 = 0$ and γ, δ are the roots of $x^2 + qx + 1 = 0$ then $(\alpha - \gamma)(\beta - \gamma)(\alpha + \delta)(\beta + \delta) =$

A. $2p^2$

B. $2p^2$

C. $p^2 - q^2$

D. $q^2 - p^2$

Answer: D

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38. If α, β are the roots of $ax^2 + 2bx + c = 0$ and $\alpha + \sigma, \beta + \sigma$ are the roots of $Ax^2 + 2Bx + c = 0$ then $\dfrac{b^2 - ac}{B^2 - AC} =$

A. a/A

B. A/a

C. $(a/A)^2$

D. $(A/a)^2$

Answer: C

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39. α, β are the roots of $ax^2 + bx + c = 0$ and γ, σ are the roots of $px^3 + qx + r = 0$ and $D_1 : D_2$ be the respective discrimination of these equations .If $\alpha, \beta\gamma$ and δ are in A.P then $D_1 : D_2$=

A. $a^2 : p^2$

B. $b^2 : q^2$

C. $c^2 : r^2$

D. none

Answer: A

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40. The ratio of the roots of the equation $ax^2 + bx + c = 0$ is same as the ratio of the roots of the equation $px^2 + qx + r = 0$. If D_1 and D_2 are the discrimination of $ax^2 + bx + c = 0$ and $px^2 + qx + r = 0$ respectively, then $D_1 : D_2$ =

A. $a^2 : p^2$

B. $b^2 : q^2$

C. $c^2 : r^2$

D. none

Answer: B

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41. α, β are the roots of $ax^2 + bx + c = 0$ and γ, σ are the roots of $px^3 + qx + r = 0$ and $D_1 : D_2$ be the respective discrimination of these equations .If $\alpha, \beta\gamma$ and δ are in A.P then $D_1 : D_2$=

A. $a^2 : p^2$

B. $a^2 : b^2$

C. $a^2 : c^2$

D. $a^2 : d^2$

Answer: A

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42. Let p and q be the roots of $x^2 - 2x + A = 0$ and let r and s be the roots of $x^2 - 18 + B = 0$. If $p < q < r < s$ are in ordered pair (A , B) =

A. $(-3, 77)$

B. $(77, -3)$

C. $(-3, -77)$

D. none of these

Answer: A

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43. 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_2, 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

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44. Let α, β be the roots of $x^2 - x + p = 0$ and γ, δ be the roots of $x^2 - 4x + q = 0$. If $\alpha, \beta, \delta, \gamma$ are in G.P then the integral values of p and q respectively , are

A. $-2, \ -32$

B. $-2, 3$

C. $-6, 3$

D. $-6, \ -32$

Answer: A

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45. x_1 and x_3 are the roots of the equation $Ax^2 - 4x + 1 = 0$ and x_2 and $x_4 = 0$ are the roots of the requation $Bx^2 - 6x + 1 = 0$ if x_1, x_2, x_3, x_4 form a H.P , then (A,B) =

A. $(3, 3)$

B. $(8, 8)$

C. $(3, 8)$

D. $(8, 3)$

Answer: C

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46. The coefficient of x in a quadratic equation $x^2 + px + q = 0$ was taken as 17 in place of 13 and its roots found to be -2 and -15. The roots of the original equation are

A. $2, 15$

B. $10, 3$

C. $-10, -3$

D. $-2, -15$

Answer: C

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47. The students while solving a quadratic equation in x, one copied the constant term incorreclty and got the roots 3 and 2 , The order copied the constant term and coefficient of x^2 as -6 and 1 respectively The correct roots are

A. $3, \ -2$

B. $-3, 2$

C. $-6, \ -1$

D. $6, \ -1$

Answer: D

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48. If 8 and 2 are the roots of $x^2 + ax + \beta = 0$ and $3, 3$ are the roots of $x^2 + \alpha x + b = 0$ then the roots of the equation $x^2 + ax + b = 0$ are

A. $1, -1$

B. $-9, 2$

C. $-8, -2$

D. $9, 1$

Answer: D

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49. IF x_1 and x_2 are the real roots of the equation $x^2 - kx + c = 0$ then the distance between the points A

$\left(x_1, 0\right)$ and $\left(x_2, 0\right)$ is

A. $\sqrt{k^2 - c}$

B. $\sqrt{c - k^2}$

C. $\sqrt{k^2 - 4c}$

D. $\sqrt{k^3 + 4c}$

Answer: C

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50. If one root of the equation $Ix^2 - 2(1 + i)x + (2 - i) = 0$ is 2- I then the root is

A. $-i$

B. $2 + i$

C. i

D. $2 - i$

Answer: A

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51. If one root of $x^2 + ax + 8 = 0$ is 4 and the equation $x^2 + ax + b = 0$ has equal roots then the value of b=

A. 7

B. 9

C. 1

D. 3

Answer: B

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52. IF the roots of the equation $x^2 - 5x + 16 = 0$ are α, β and the roots of the equation $x^2 + px + q = 0$ and $\alpha^2 + \beta^2, \frac{\alpha\beta}{2}$, then

A. $p = 1, q = -56$

B. $p = -1, q = -56$

C. $p = 1, q = 56$

D. $p = -1, q = 56$

Answer: B

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53. IF $x^2 - 3x + 2$ is a factor of $x^4 - px^2 + q = 0$ then $(p, q) = 0$

A. $(-4, -5)$

B. $(4, 5)$

C. $(-5, -4)$

D. $(5, 4)$

Answer: D

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54. IF the product of the roots of $5x^2 - 4x + 2 + m\left(4x^2 - 2x - 1\right) = 0$ is 3, then m=

A. 0

B. -1

C. 2

D. 3

Answer: B

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55. IF $k > 0$ and the product of the roots of the equation $x^2 - 3kx + 2e^2 \log k$-1=0 is 7 then the sum of the roots is

A. 2

B. 4

C. 6

D. 8

Answer: C

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56. The value of K , so that the sum and product of the roots of $2x^2 + (k - 3)x + 3k - 5 = 0$ are equal is

A. 0

B. 10

C. 2

D. 9

Answer: C

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57. IF the sum of the square of the roots of $x^2 + px - 3 = 0$ is 10 then the values of p=

A. $+_2$

B. ± 3

C. 3

D. -3

Answer: A

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58. α, β are the roots of $x^2 + kx + 2 = 0$. If α - $\beta = 1$ then K=

A. ± 1

B. ± 2

C. ± 3

D. ± 4

Answer: C

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

A. 150

B. 254

C. 180

D. 1022

Answer: D

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60. The harmonic mean of the roots of the equation $\left(5+\sqrt{2}\right)x^2 - \left(4+\sqrt{5}\right)x + \left(8+2\sqrt{5}\right)=0$ is

A. 2

B. 4

C. 6

D. 8

Answer: B

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61. IF C and D are the roots of $(x-a)(x-b)-k=0$ then the roots of $(x-c)(x-d)+k=0$ are

A. b,c

B. a,b

C. a,c

D. a,d

Answer: B

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62. IF α, β be the roots of the equation $(x - a)(x - b) + c = 0(c \neq 0)$ then the roots of the equation $(x - c - \alpha)(x - c - \beta)$ =c are

A. a and b+c

B. a+c and b

C. a+c and b+c

D. a-c and b-c

Answer: C

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63. The equation whose roots are $2\sqrt{3}$- 5 and -2 $\sqrt{3}$ - 5 is

A. $x^2 + 10x - 13 = 0$

B. $x^2 - 10x + 13 = 0$

C. $x^2 + 10x + 13 = 0$

D. $x^2 - 10 - 13 = 0$

Answer: C

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64. The equation whose roots are $3 + 2I, 3 - 2i$ is

A. $x^2 - 8x + 15 = 0$

B. $15x^2 - 34 + 15 = 0$

C. $x^2 - 6x + 13 = 0$

D. $x^2 + 1 = 0$

Answer: C

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

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

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

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

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

Answer: A

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66. IF α, β are the roots of $x^2 + 5x - 4 = 0$ then the equation whose roots are $\frac{\alpha + 2}{3}, \frac{\beta + 2}{3}$ is

A. $9x^2 + 3x + 10 = 0$

B. $9x^2 + 3x - 10 = 0$

C. $9x^2 + x = 0$

D. $2x^2 - 3x + 10 = 0$

Answer: B

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67. If α, β are the roots of $x^2 - x + 1 = 0$ then the quadratic equation whose roots are $\alpha^{2015}, \beta^{2015}$ 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

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68. IF α, β are the roots of $x^2 - ax + b = 0$, then the whose roots are $\frac{\alpha + \beta}{\alpha}, \frac{\alpha + \beta}{\beta}$ is

A. $bx^2 + a^2x + a^2 = 0$

B. $bx^2 - a^2x + a^2 = 0$

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

D. $ax^2 + b^2x + b^2 = 0$

Answer: B

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69. IF α, β are the roots of $ax^2 + bx + c = 0$ then the equation roots are $\alpha/\beta, \beta/\alpha$ is

A. $acx^2 - \left(b^2 - 2ac\right)x + ac = 0$

B. $a^3x^2 + \left(b^3 - 3abc\right) + x + c^3 = 0$

C. $x^2 - 2qx + \left(q^2 - p^2\right) = 0$

D. $x^2 + 2qx + \left(q^2 + p^2\right) = 0$

Answer: A

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70. IF α, β are the roots of the equation $ax^2 + bx + c = 0$ then the quadratic equation whose roots are $\alpha + \beta, \alpha\beta$ is

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

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

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

D. $ax^2 - (b + c) - bc = 0$

Answer: B

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71. In a ΔABC, the value of $\angle A$ is obtained from the equation $3\cos A + 2 = 0$. The quandratic equation , whose roots are $\sin A$ and $\tan A$ is

A. $3x^2 + \sqrt{5x} - 5 = 0$

B. $6x^2 - \sqrt{5}x - 5 = 0$

C. $6x^2 + \sqrt{5}x - 5 = 0$

D. $6x^2 + \sqrt{5}x + 5 = 0$

Answer: C

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72. The equation whose roots are the cubes of the roots of the equation $ax^2 + bx + c = 0$ is

A. $a^3x^2 + \left(b^2 - 3abc\right)x + c^3 = 0$

B. $a^3x^2 + \left(b^2 + 3abc\right)x + c^2 = 0$

C. $a^3x^2 - \left(b^3 + 3abc\right)x + c^2 = 0$

D. none

Answer: A

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73. IF α, β are the roots of $ax^2 + bx + c = 0$ and γ, δ are the roots of $lx^2 + mx + n = 0$ then the equation whose roots are $\alpha\gamma + \beta\delta, \alpha\delta + \beta\gamma$ is

A. $a^2t^2x^2 - ablmx + b = 0$

B. $a^2t^2x^2 - ablmx + \left(b^2nl + m^2ac - 4acnl\right) = 0$

C. $a^3t^2x^2$ - $ablmx$

D. none

Answer: B

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74. IF

$a = \cos\left(\frac{2\pi}{7}\right) + i\sin\left(\frac{2\pi}{7}\right), \alpha = a + a^2 + a^4$ and $\beta = a^3 + a^5 + a^6$

then α, β are the roots of the equation

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

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

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

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

Answer: B

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75. Let $\alpha \neq \beta$ satisfy $\alpha^2 + 1 = 6\alpha, \beta^2 + 1 = 6\beta$. Then, the quadratic equation whose roots are $\frac{\alpha}{\alpha + 1}, \frac{\beta}{\beta + 1}$ is

A. $8x^2 + 8x + 1 = 0$

B. $8x^2 - 8x - 1 = 0$

C. $8x^2 - 8x + 1 = 0$

D. $8x^2 + 8x - 1 = 0$

Answer: C

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76. IF $3p^2 = 5p + 2$ and $3q^2 = 5q + 2$ where $p \neq q$ then the equation whose roots are $3p - 2q$ and $3q - 2p$ is

A. $3x^2 - 5x - 100 = 0$

B. $5x^2 + 3x + 100 = 0$

C. $3x^2 - 5x + 100 = 0$

D. $3x^2 + 5x - 100 = 0$

Answer: A

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77. IF α, β are the roots of the equation $x^2 + 2ax + b = 0$, then the quadratic equation with rational coefficient one of whose roots is $\alpha + \beta + \sqrt{\alpha^2 + \beta^2}$ is

A. $x^2 - 4ax + 12 = 0$

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

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

D. $x^2 + 4ax + 2b = 0$

Answer: D

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78. The quadratic equation for which the sum of the roots is 7 and the sum of the squares of the roots is 25 is

A. $x^2 - 7x + 12 = 0$

B. $x^2 \pm 54x + 6 = 0$

C. $x^2 - 12x + 35 = 0$

D. $5x^2 + 2x + 11 = 0$

Answer: A

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79. The quadratic equation for which the sum of the roots is 12 and the sum of the cubes of the roots is 468 is

A. $x^2 - 7x + 12 = 0$

B. $x^2 \pm 54x + 6 = 0$

C. $x^2 - 12x + 35 = 0$

D. $5x^2 + 2x + 11 = 0$

Answer: C

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80. IF $\alpha + \beta$ =- 2 and alpha ^3 + beta ^3 =- 56 , $then the \ \ ratic equation whose \sqrt[s]{are}$ alpha and beta ` is

A. $x^2 + 2x - 16 = 0$

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

C. $x^2 + 2x - 12 = 0$

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

Answer: D

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81. Two complex numbers α and β are such that $\alpha + \beta = 2$ and $\alpha^4 + \beta^4 = 272$, then the quadractic equation whose roots are α and β is

A. $x^2 - 2x - 16 = 0$

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

C. $x^2 - 2x - 8 = 0$

D. none of these

Answer: C

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82. IF the arithmetic mean of the roots of a quadratic equation is 8/5 and the arithmetic mean of their reciprocals is 8/7 then the equation is

A. $5x^2 + 16x + 7 = 0$

B. $5x^2 - 16x + 7 = 0$

C. $7x^2 + 16x + 5 = 0$

D. $7x^2 - 16x + 5 = 0$

Answer: B

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83. Let two numbers have arthmetic mean 9 geometric mean 4. then these numbers are the roots of the quadratic equation

A. $x^2 + 18x + 16 = 0$

B. $x^2 - 18x - 16 = 0$

C. $x^2 + 18 - 16 = 0$

D. $x^2 - 18 + 16 = 0$

Answer: D

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84. The equation whose roots are the arthmatic mean and twice the H.M between the roots of the equation $x^2 + ax - b = 0$ is

A. $2ax^2 + \left(a^2 - 8b\right)x + 4ab = 0$

B. $2ax^2 + \left(a^2 - 8b\right)x - 4ab = 0$

C. $2ax^2 + \left(a^2 + 8b\right)x - 4ab = 0$

D. none

Answer: B

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85. IF α, β are the roots of $9x^2 + 6x + 1 = 0$ then the equation with the roots $1/\alpha, 1/\beta$ is

A. $2x^2 + 3x + 18 = 0$

B. $x^2 + 6x - 9 = 0$

C. $x^2 + 6x + 9 = 0$

D. $x^2 - 6x + 9 = 0$

Answer: C

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86. The equation whose roots are greater by 1 than those of $2x^2 - 3x + 1 = 0$ is

A. $3x^2 - 5x - 2 = 0$

B. $2x^2 - 7x + 6 = 0$

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

D. $3x^2 + \ \% \, x - 7 = 0$

Answer: B

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87. IF α, β are the roots of $ax^2 + bx + c = 0$ then the equation whose roots are $2 + \alpha, 2 + \beta$ is

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

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

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

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

Answer: D

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88. The equation whose roots are smaller by 1 then those of $2x^2 - 5x + 6 = 0$ is

A. $2x^2 - 9x + 13 = 0$

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

C. $2x^2 + 9x + 13 = 0$

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

Answer: B

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89. the equation formed by decreasing each root of $ax^2 + bx + C = 0$ by 1 is $2x^2 + 8x + 2 = 0$ then

A. $a = -b$

B. $b = -c$

C. $c = -a$

D. $b = a + c$

Answer: B

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

A. $\left(\frac{b}{a} - \frac{q}{p}\right)$

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

Answer: B

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91. IF α, β are the roots of $x^2 + bx + c = 0$ and $\alpha + h, \beta + h$ are the roots of $x^2 + qx + r = 0$ then h=

A. $b + q$

B. $b - q$

C. $\frac{1}{2}(b + q)$

D. $\frac{1}{2}(b - q)$

Answer: D

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92. IF α and β are the roots of the equation $ax^2 + bx + C = 0$ and if $px^2 + qx + r = 0$ has roots $\frac{1 - \alpha}{\alpha}$ and $\frac{1 - \beta}{\beta}$ then r=

A. $a + 2b$

B. $a + b + C$

C. $ab + bc + ca$

D. abc

Answer: B

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93. The equation whose roots are numerically equal but opposite in sign of the roots of $3x^2 - 5x - 7 = 0$ is

A. $3x^2 - 5x - 2 = 0$

B. $2x^2 - 7x + 6 = 0$

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

D. $3x^2 + 5x - 7 = 0$

Answer: D

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94. The equation whose roots are multipled by 3 of those of $2x^2 + 3x - 1 = 0$ is

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

B. $2x^2 - 7x + 6 = 0$

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

D. $3x^2 + 5x - 7 = 0$

Answer: A

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95. The condition that one root of $ax^2 + bx + c = 0$ may be n times the other root is

A. $nb^2 = ac(n+1)$

B. $nb^2 = ac(n+1)^2$

C. $nb = ac(n+1)$

D. $nb = ac(n+1)^2$

Answer: B

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96. The condition that one root of $ax^2 + bx + c = 0$ may be the double the other is

A. $b^2 = 2ac$

B. $b^2 = 2ac$

C. $2b^2 = 9ac$

D. $2b^2 = 3ac$

Answer: C

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97. If one root of $x^2 + kx + 12 = 0$ may be the triple the other , then k=

A. ± 8

B. 3

C. $\pm 5\sqrt{10}$

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

Answer: A

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98. IF one root of $px^2 - 14x + 8 = 0$ is six times the other then $p =$

A. 1

B. 2

C. 3

D. 4

Answer: C

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99. IF the roots of $ax^2 + cx + c = 0$ are in the ratio p:q then

$$\sqrt{\left[\frac{p}{q}\right]} + \sqrt{\left[\frac{q}{p}\right]} =$$

A. $\sqrt{a/c}$

B. $\sqrt{c/a}$

C. $-\sqrt{a/c}$

D. $-\sqrt{c/a}$

Answer: D

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100. IF one root of $x^2 - x - k = 0$ is square that of the other, then k=.........

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

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

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

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

Answer: C

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101. If one root of $x^2 + px + 1 = 0$ is square that of the other thenp=

A. $1, \ -2$

B. $3, \ -1$

C. $2, \ -\sqrt{5}$

D. $4 + \sqrt{5}$

Answer: A

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102. IF the harmonic mean between the roots of $\left(5 + \sqrt{2}\right)x^2 - bx + \left(8 + 2\sqrt{5}\right) = 0$ is 4 then value of b is

A. 2

B. 3

C. $4 - \sqrt{5}$

D. $4 + \sqrt{5}$

Answer: D

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103. IF the harmonic mean of the roots of $\sqrt{2}x^2 - bx + \left(8 - 2\sqrt{5}\right) = 0$ is 4 then the value of b=

A. 2

B. 3

C. $4 - \sqrt{5}$

D. $4 + \sqrt{5}$

Answer: C

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104. The condition that a root of $ax^2 + bx + c = 0$ may be the reciprocal of a root of $a_1x^2 + b_1x + c_1 = 0$ is

A. $\left(aa_1 - cc_1\right)^2\left(ab_1 + bc_1\right)\left(a_1b + b_1c\right)$

B. $\left(aa_1 - cc_1\right)^2 = \left(ab_1 - bc_1\right)\left(a_1b - b_1c\right)$

C. $\left(aa_1 - bb_1\right)^2 = \left(ac_1 - bc_1\right)$

D. none

Answer: B

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105. IF the sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to sum of the square of their reciprocals then $\frac{b^2}{ac} + \frac{bc}{a^2} =$

A. 2

B. -2

C. 1

D. -1

Answer: A

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106. IF the sum of the roots of the equation $x^2 + px + q = 0$ is 3 times their difference , then

A. $2p^2 = q$

B. $2p^2 = 5q$

C. $p^2 = 3q$

D. $2p^2 = 9q$

Answer: D

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107. If the roots of the equation $ax^2 + bx + c = 0$ be the square roots of the equation $lx^2 + mx + n = 0$ then

A. $2alc = lb^2 + ma^2$

B. $2alc = lb^2 - ma^2$

C. $alc = lb^2 + ma^2$

D. $alc = lb^2 - ma^2$

Answer: A

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108. IF the ratio of the roots of $x^2 + bx + c = 0$ and $x^2 + qx + r = 0$ are the same , then

A. $r^2c = qb^2$

B. $r^2b = qc^2$

C. $rb^2 = cq^2$

D. $rc^2 = bq^2$

Answer: C

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109. If the ratio of the roots of $a(x)^2 + bx + c = 0$ is same as that of the roots of $px^2 + qx + r = 0$ then $a/p, b/q, c/r$ are in

A. $A.P$

B. $G.P$

C. $H.P$

D. none

Answer: B

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110. The value of m for which one of the roots of $x^2 - 3x + 2m = 0$ is double of one of the roots of $x^2 - x + m = 0$is

A. 1

B. -2

C. 2

D. none

Answer: B

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111. IF the difference of the roots of $x^2 - bx + c = 0$ is equal to the difference of the roots of $x^2 - cx + b = 0$ and $b \neq 0$, then b+c=

A. -1

B. -2

C. -3

D. -4

Answer: D

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112. The condition that the roots of the equation $ax^2 + bx + c = 0$ may differ by 5 is

A. $b^2 - 25a^2 = 4ac$

B. $b^2 - 5a^2 = 4ac$

C. $b^2 + 15a^2 = 4ac$

D. none

Answer: A

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113. The condition that sin θ cos θ may be the roots of $ax^2 + bx + c = 0$ is

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

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

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

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

Answer: B

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114. If $\sin\alpha$ and $\cos\alpha$ are the roots of $25x^2 + 5x - 12 = 0$, then value of sin2alpha ` is

A. $12/25$

B. $-12/25$

C. $-24/25$

D. $4/5$

Answer: C

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115. IF $\tan A$ and $\tan B$ are the roots of the quadratic $x^2 - px + q = 0$ then $\sin^2(A + B) =$

A. $\frac{p^2}{p^2 + q^2}$

B. $\frac{p^2}{(p + q)^2}$

C. $1 - \frac{p}{(1 - q)^2}$

D. $\frac{p^2}{p^2 + (1 - q)^2}$

Answer: D

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116. In a triangle PQR angle $R = \pi/2$ if $\tan(p/2)$ and $\tan(Q/2)$ are the roots of the equation $ax^2 + bx + c = 0(a \neq 0)$ then

A. a+b=c

B. $b + c = 0$

C. a+c=b

D. b=c

Answer: A

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117. In a triangle $PQR \angle R = \frac{\pi}{4}$, if $\tan\left(\frac{p}{3}\right)$ and $\tan\left(\frac{Q}{3}\right)$ are the roots of the equation $ax^2 + bx + c = 0$ then

A. a+b=c

B. b+c=0

C. a+c=b

D. b=c

Answer: A

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118. If one root of $x^2 + px + 1 = 0$ is the cube of the other root, then p=

A. 0

B. 1

C. $1, \pm 2$

D. $0, \pm 2$

Answer: D

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119. IF one root of $ax^2 + bx + c = 0$ is equal to nth power of the other then $\left(a^n c\right)^{\frac{1}{n+1}} + \left(ac^n\right)^{\frac{1}{n+1}}$

A. 0

B. 1

C. b

D. -b

Answer: D

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120. IF x,a,b,c are real and $\left(x - a + b^2\right) + (x - b + c)^2 = 0$ then a,b,c are in

A. H.P

B. G.P

C. A.P

D. none of these

Answer: C

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121. IF the roots of $\frac{1}{x+a} + \frac{1}{x+b} = \frac{1}{c}$ are equal in magnitude and opposite in sign then the product of the roots is

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

B. $\frac{1}{2}\left(a^2+b^2\right)$

C. $-\frac{3}{2}\left(a^2+b^2\right)$

D. none

Answer: A

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122. IF the roots of the equation $\frac{1}{x+p}+\frac{1}{x+q}=\frac{1}{r}$ are equal in magnitude and opposite in sign , then p+q +r=

A. r

B. 3r

C. r°

D. $2r^2$

Answer: B

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123. IF $\frac{1}{x} + \frac{1}{x+a} = \frac{1}{m} + \frac{1}{m+a}$ has roots equal in magnitude but oppposite insign , then

A. $a^2 = m^2$

B. $a^2 = 2m^2$

C. $2a^2 = m^2$

D. none

Answer: B

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124. IF the roots of $a^2x^2 - abx$+c=0 $areconsecutive\int e \geq rs, then$b^2-a^2`=

A. 14C

B. 7c

C. 5c

D. 4c

Answer: D

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125. If r is the ratio of the roots of $ax^2 + bx + C = 0$ then

$$\frac{(r+1)^2}{r} =$$

A. 1

B. $b^2 - ac$

C. b^2/ac

D. $b^2 - 4ac$

Answer: C

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126. IF the roots of $ax^2 + bx + c = 0$ are of the form $\frac{m+1}{m}, \frac{m+2}{m+1}$ then $(a + b + c)^2$ =

A. 0

B. 1

C. b^2 - $4ac$

D. $2abc$

Answer: C

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127. IF $(a\alpha + b)^{-2} + (a\beta + b)^{-2}$ =1 , where α, β are the roots of $ax^2 + bx + c = 0$ then $ac(ac + 2) =$

A. $b^2/2$

B. b^3

C. $2b$

D. b^2

Answer: D

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128. IF the equation $x^2 + 2(k+1)x + 9k - 5 = 0$ has only negative roots , then

A. $k \leq 0$

B. $k \geq 0$

C. $k \geq 6$

D. $k \leq 6$

Answer: C

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129. All the values of m for which both roots of the equation $x^2 - 2mx + m^2 - 1 = 0$ are greater than -2 but less than 4, lie in the interval

A. $-1 < m < 3$

B. $1 < m < 4$

C. $-2 < m < 0$

D. $m > 3$

Answer:

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130. The values of a for which of a for which $2x^2 - 2(2a + 1)x + a(a + 1) = 0$ may have ine root less than a and other root greater than a are given by

A. $1 > a > 0$

B. $-1 < a < 0$

C. $a > 0$

D. $a > 0$ or $a < -1$

Answer: D

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131. The value of a for which the equation $\left(1 - a^2\right)x^2 + 2ax - 1$ has roots belonging to (0,1) is

A. $a > \dfrac{1 + \sqrt{5}}{2}$

B. $a > 2$

C. $\dfrac{1 + \sqrt{5}}{2} < a < 2$

D. $a > \sqrt{2}$

Answer: B

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132. The value of a for which each one of the roots of $x^2 - 4ax + 2a^2 - 3a + 5 = 0$ is greater than 2, are

A. $a \in (1, \infty)$

B. $a = 1$

C. $a \in (-\infty, 1)$

D. $a \in (9/2, \infty)$

Answer: D

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133. The value of 'a' for which one root of the quadratric equation $\left(a^2 - 5a + 3\right)x^2 + (3a - 1)x + 2 = 0$ is twice as large as the other is

A. $-2/3$

B. $1/3$

C. $-1/3$

D. $2/3$

Answer: D

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134. IF both the roots of the quadratic equation $x^2 - 2kx + k^2 + k - 5 = 0$ are less than 5, then k lies in the interval

A. $(5, 6]$

B. $(6, \infty)$

C. $(- \infty, 4)$

D. $[4, 5]$

Answer: C

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135. If roots of the equation $x^2 - bx + c = 0$ be two consecutive integers , then $b^2 - 4c$ equals

A. -2

B. 3

C. 2

D. 1

Answer: D

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136. p and q are distinct prime numbers and if the equation $x^2 - px + q = 0$ has positive integer as its roots then the roots the roots of the equation are

A. $2, 3$

B. $1, 2$

C. $3, 1$

D. $1, -1$

Answer: B

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137. IF both the roots of the equation $x^2 - 6ax + 2 - 2a + 9a^2 = 0$ exceed 3, then

A. $a > \frac{9}{11}$

B. $a > \frac{11}{9}$

C. $a > \frac{11}{9}$

D. $a < \frac{11}{9}$

Answer: C

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138. If the roots of $x^2 + x + a = 0$ exceed , a then

A. $2 < a < 3$

B. $a > 3$

C. $-3 < a < 3$

D. $a < \frac{1}{-2}$

Answer: D

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139. The roots of $3x^2 + 4x - 7 = 0$ are

A. rational and equal

B. rational and not equal

C. irrational

D. imaginary

Answer: B

Watch Video Solution

140. The roots of $5x^2 - 3x + 2 = 0$ are

A. rational and equal

B. rational and not equal

C. irrational

D. imaginary

Answer: D

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141. The roots of the equation $(b - c)x^2 + (c - a)x + (a - b) = 0$ are

A. real

B. real and equal

C. real and not equal

D. imaginary

Answer: A

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142. IF ad $\neq$ bc then the roots of $\left(a^2+b^2\right)x^2+2x(ac+bd)+\left(c^2+d^2\right)=0$ are

A. real

B. real and equal

C. real and not equal

D. imaginary

Answer: D

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143. For $p, q \in R$, the roots of $\left(p^2 + q^2\right)x^2 + 2(p + q)x + 2 = 0$ are

A. real and equal

B. real and unequal

C. equal complex numbers

D. unequal complex numbers

Answer: D

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144. The roots of the equation $2\left(a^2+b^2\right)x^2+2(a+b)x+1=0$ are

A. real

B. real and equal

C. real and not equal

D. imaginary

Answer: D

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145. The roots of $(x - b)(x - c) + (x - a)(x - c) + (x - a)(x - b) = 0$ are

A. real

B. equal

C. real and not equal

D. imaginary

Answer: A

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146. The roots of $(x - a)(x - a - 1) + (x - a - 1) + (x - a - 2) + (x - a)(x - a - 2) = 0$

a $\in \mathbb{R}$ are always

A. equal

B. imaginary

C. real and distinct

D. rational and equal

Answer: C

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147. IF l,m,n are rational the roots of $(m+n)x^2 - (l+m+n)x + l = 0$ are

A. rational

B. rational and equal

C. rational and not equal

D. irrational

Answer: A

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148. If the roots of $a^2x^2 + 2bx + c^2 = 0$ are imaginary then the roots of b$\left(x^2 + 1\right) + 2acx = 0$ are

A. real and equal

B. real nad unequal

C. equal complex numbers

D. unequal complex numbers

Answer: B

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149. IF the roots of $\left(a^2+b^2\right)x^2+2(bc+ad)x+\left(c^2+d^2\right)=0$ are real and equal then

A. $a/c=b/d$

B. $ac+bd=0$

C. ad+bc=0

D. $ac-bd=0$

Answer: D

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150. IF m,n,K are rational and $m = k + \frac{n}{k}$ then the roots of $x^2 + mx + n = 0$ are

A. $k, n/k$

B. $k, n/k$

C. -k, - n/k

D. -$k, n/k$

Answer: C

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151. IF α, β are 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 $x^2 - 4qx + 2q^2 - r = 0$ has always

A. two real roots

B. two negative roots

C. two positve roots

D. one positive root and one negative root

Answer: A

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152. Let a, b, c be real numbers $a \neq 0$ if α is a roots of $a^2x^2 + bx + c = 0, \beta$ is a roots of $a^2x^2 - bx - c = 0$ and $0 < \alpha < \beta$, then the equation $a^2x^2 + 2bx + 2c = 0$ has a root γ has a rootγ that always satisfies

A. $\gamma = (\alpha + \beta)/2$

B. $\gamma = \left(\alpha + \frac{\beta}{2}\right)$

C. $\gamma = \alpha$

D. $\alpha < \gamma < \beta$

Answer: D

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153. If $p(x) = ax^2 + bx + c$ and $Q(x) = -ax^2 + dx + c$

where $ac \neq 0$ then the equation $P(x).\ Q(x) = 0$ has atleast

A. two real roots

B. two negative roots

C. two positve roots

D. one positive root and oine negative

Answer: A

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154. Let $f(x) = x^2 + ax + b$, where a, b $\in \mathbb{R}$. If f(x) =0 has

all its roots imaginary , then the roots of f(x) + f'(x) + f(x)

=0` are :

A. real and distinct

B. imaginary

C. equal

D. rational and equal

Answer: B

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155. a,b,c $\in R\alpha$ is a root of $a^2x^2 + bx + c = 0\beta$ is a root of $a^2x^2 - bx - c = 0$ and γ is a root of $a^2x^2 + 2bx + 2c = 0$ then

A. $\begin{vmatrix} -\beta^2 & \beta & 1 \\ \alpha^2 & \alpha & 1 \\ \gamma^2 & 2\gamma & 2 \end{vmatrix} = 0$

B. $\begin{vmatrix} -\beta^2 & \beta & 1 \\ \alpha^2 & \alpha & 1 \\ \gamma^2 & \gamma & 2 \end{vmatrix} = 0$

C. $\begin{vmatrix} -\beta^2 & \beta & 1 \\ \alpha^2 & \alpha & 1 \\ \gamma^2 & 2\gamma & 2 \end{vmatrix} = 0$

D. none

Answer: A

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156. IF the roots of the equation $x^2 + a^2 = 8x + 6a$ are real , then a lies between

A. 1 and 2

B. -1 and 8

C. 2 and 8

D. -2 and 8

Answer: D

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157. If the equation $(\cos p - 1)x^2 + \cos px + \sin p = 0$ in the varable x has real roots then p can taken any value in the interval

A. $(0, 2\pi)$

B. $(-\pi, 0)$

C. $(-\pi/2, \pi/2)$

D. $(0, \pi)$

Answer: D

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158. If $m, \in Z$ and the equation $mx^2 + (2m - 1)x : (m - 2) = 0$ has rational roos them m is of the form

A. $n(n + 2), n \in z$

B. $n(n + 1), n \in z$

C. $n(n - 2), n \in z$

D. none

Answer: B

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159. If a $\in Z$ and the equation $(x - a)(x - 10) + 1 = 0$ has integral roots then the values of a are

A. $10, 8$

B. $12, 10$

C. 12, 8

D. none

Answer: C

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160. IF $\in R$ and the equation $-3(x - [x]) + a^2 = 0$ (where [x] denotes the greatest ineteger $\leq x$) has no integral solution , then all possible values of a lie in the interval

A. $(-2, 1)$

B. $(-\infty, -2) \cup (2, \infty)$

C. $(-1, 0) \cup (0, 1)$

D. $(1, 2)$

Answer: C

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161. If the roots of the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0 k > 0$ are real then K=

A. 8

B. 12

C. 16

D. 24

Answer: C

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162. IF the roots of the equation $ax^2 + bx + c = 0$ are real and distinct , then

A. both roots are greater than $-b/2a$

B. both roots are less than $-b/2a$

C. one of the roots exceeds $-b/2a$

D. none

Answer: C

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163. If the roots of $ax^2 + bx + c = 0$ are both positve , then

A. alt0,Clt0

B. alt 0, cgt0

C. agt 0 ,Clt0

D. agt0,Cgt0

Answer: D

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164. IF the roots of $ax^2 + bx + c = 0$ are both negative and b < 0 then

A. alt0,Clt0

B. alt 0, cgt0

C. agt 0 ,Clt0

D. agt0,Cgt0

Answer: A

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165. IF the roots of $ax^2 + bx + c = 0$ are equal in magnitude but opposite in sign then

A. alt0,clt0

B. alt0,cgt 0,bgt0

C. agt 0, b=0,Clt0

D. agt0,b=0,cgt0

Answer: C

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166. if P , q, r are positive and are in A.P the roots of the quadrativ $px^2 + qx + r = 0$ real for

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

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

C. all p and r

D. no p nad r

Answer: A

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167. IF $(1+k)\tan^2 x - 4\tan x - 1 + k = 0$ has real roots $\tan x_1$ and $\tan x_2$ then

A. $K^2 \leq 5$

B. $k^2 \geq 6$

C. $k = 3$

D. none

Answer: A

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168. IF 0 < a

A. $|\alpha| = |\beta|$

B. $|\alpha| < 1$

C. $|\beta| < 1$

D. none

Answer: A

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169. if 0 < a < b> 0 nad c > 0 then both the roots of the equation $2ax^2 + 3bx + 5c = 0$

A. are real and negative

B. have negative real parts

C. have positive real parts

D. none

Answer: B

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170. IF p,q, ∈ { 1,2,3.4} the number of equation of the form $px^2 + qx + 1 = 0$ having real roots is

A. 15

B. 9

C. 7

D. 8

Answer: C

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171. If the equation $x^2 - 2mx + 7m - 12 = 0$ has equal roots then m=

A. 2 or 3

B. 3 or 4

C. 4 or 5

D. 5 or 6

Answer: B

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172. IF the roots of $(3m+1)x^2+2(m+1)x+m=0$ are equal then m=

A. 4/2,1

B. $-1/2, 1$

C. $2, 1/2$

D. $2, \ -1/2$

Answer: B

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173. IF the roots of $x^2 - 2(5+2k)x + 3(7+10k)$ are equal then k=

A. 4/2,1

B. $-1/2, 1$

C. $2, 1/2$

D. $2, \ -1/2$

Answer: C

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174. If the quadratic expression $x^2 - (a-1)x + \left(a + \frac{1}{4}\right)$ will be a perfect square then a=

A. 0, 4

B. 2, 6

C. 2, 4

D. 0, 6

Answer: D

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175. IF $(x - a)$(x-b) +(x-b) (x-c) +(x-a)(x-c)` =0 has equal roots then the relation between a , b and c is

A. a+b+c=0

B. a=b=c

C. $b^2 = ac$

D. $a + c = 2b$

Answer: B

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176. If $c^2 \neq ab$ and the roots of $\left(c^2 - ab\right)x^2 - 2\left(a^2 - bc\right)x + \left(b^2 - ac\right) = 0$ are equal, then show that $a^3 + b^3 + c^3 = 3abc$ or $a = 0$

A. $a^3 + b^3 + c^3 = 3abc$ or $a = 0$

B. $a^2 + b^2 + c^2 = ab + bc + ca$

C. $abc = a + b + C$

D. $a = b = c$

Answer: A

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177. The roots of the equation $(a - b)x^2 + (b - c)x + (c - a)$ =0 are

A. $a, b,$

B. b, c

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

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

Answer: C

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178. The roots of the equation $a(b-c)x^2 - b(c-a)x + c(a-b) = 0$ are

A. $ab + bc + ca, 1$

B. $a + b + c, ab + bc + ca$

C. $1, \dfrac{c(a-b)}{a(b-c)}$

D. $1, \dfrac{b(c-a)}{a(b-c)}$

Answer: C

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179. If $p(q - r)x^2 + q(r - p)x + r(p - q) = 0$ has equal roots then 2/q =

A. $\frac{1}{p} + \frac{1}{r}$

B. $\frac{1}{p} - \frac{1}{r}$

C. $p + r$

D. pr

Answer: A

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180. IF the roots of $(b - c)x^2 + (c - a)x + (a - b) = 0$ are equal then a, b,c are in

A. AP

B. GP

C. HP

D. AGP

Answer: A

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181. IF the roots of $a(b - c)x^2 + b(c - a)x + c(a - b)=0$ are equal then a, b, c are in

A. A.P

B. G.P

C. H.P

D. none

Answer: C

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182. If the roots of $\left(a^2+b^2\right)x^2 - 2b(a+c)x + \left(b^2+c^2\right)$ =0 are equal then a, b, c are in

A. A.P

B. G.P

C. H.P

D. none

Answer: B

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183. IF the sum of the roots of $ax^2 + bx + c = 0$ is equal to the sum of the squares of the roots, then........

A. A.P

B. G.P

C. H.P

D. none

Answer: A

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184. IF α, β are the roots of the equation $ax^2 + bx + c = 0$ and $\alpha <$ - $1, \beta > 1$ then $1 + \frac{c}{a} + \left|\frac{b}{a}\right|$ is

A. positive

B. negative

C. non negative

D. non positive

Answer: B

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185. IF $3 + 4i$ is a root of the equation $x^2 + px + q = 0$ then

A. p=6,q=25

B. p=6,q=1

C. p=-6,w=-7

D. p=-6,q=25

Answer: D

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186. IF $3+i$ is a root of the equation $x^2+ax+b=0$ then a=

A. 3

B. -3

C. 6

D. -6

Answer: D

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187. IF one root of the quadratic equation $ax^2 + bx + c = 0$ is $3 - 4i$ then $a + b + c =$

A. 40a

B. 36a

C. $-20a$

D. $20a$

Answer: D

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188. IF $(1 - p)$ is a root of quadratic equation $X^2 + px + (1 - p) = 0$ then its roots are

A. $0, 1$

B. $-1, 2$

C. $0, -1$

D. $-1, 1$

Answer: C

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189. 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 the value of q is

A. $49/4$

B. 4

C. 3

D. 12

Answer: A

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190. If $x^2 - 6x + 5 = 0$ and $x^2 - 12x + p = 0$ have a common root, then find p.

A. 11 or 35

B. 22 or 45

C. 40

D. 10

Answer: A

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191. If $x^2 - hx - 21 = 0$, $x^2 - 3hx + 35 = 0$ have a common root then h=

A. ± 2

B. ± 4

C. ± 6

D. ± 8

Answer: B

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192. The value of a such that $x^2 - 11x + a = 0, x^2 - 14x + 2a = 0$ may have a common root is

A. 6

B. 12

C. 24

D. 32

Answer: C

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193. IF the equation $x^2 - x - p = 0$ and $x^2 + 2px - 12 = 0$ have a common root then that root is

A. 1

B. p+2

C. 2

D. can not be determined

Answer: C

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194. IF $x^2 + bx + c = 0, x^2 + cx + b = 0$ (b $\neq$ c) have a coomon root then b+c=

A. 0

B. 1

C. -1

D. 2

Answer: C

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195. IF $ax^2 + 2cx + b = 0$ and $ax^2 + 2bx + c = 0(b \neq 0)$ have a common root , then b+c=

A. -$a/4$

B. $a/3$

C. $a/2$

D. a

Answer: A

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196. IF $x^2 + ax + bc = 0$ and $x^2 + bx + ca = 0$ have a common root , then a + b+ c=

A. 0

B. 1

C. ab + bc + ca

D. 3abc

Answer: A

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197. If the quadratic equations $ax^2 + 2bx + c = 0$ and $ax^2 + 2cx + b = 0, (b \neq c)$ have a common root, then show that $a + 4b + 4c = 0$

A. -2

B. -1

C. 0

D. 1

Answer: C

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198. If $x^2 - cx + d = 0, x^2 - ax + b = 0$ have one common root and second has equal roots then $2(b + d) =$

A. 0

B. ac

C. a+c

D. a-c

Answer: B

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199. IF $x^2 + bx + a = 0, ax^2 + x + b = 0$ have a common root and the first equation has equal roots then $2a^2 + b =$

A. 0

B. 1

C. -1

D. 2

Answer: A

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200. IF the equations $x^2 + 2x + 3 = 0$ and $ax^2 + bx + c = 0, a, b, c \in R$ have a common root then a:b:c is :

A. $1:3:2$

B. $3:1:2$

C. $1:2:3$

D. $3:2:1$

Answer: C

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201. IF $x^2 + P_1 x + q_1 = 0, x^2 + p_2 x + q_2 = 0, x^2 + p_3 x + q_3 = 0$ has a coomon root then $p_1^2 + p_2^2 + P_3^2 + 4(q_1 + q_2 + q_3)$=

A. $2(p_1 p_2 + p_2 p_3 + p_3 p_1$

B. $(p_2 p_1 + q_2 q_3 + q_3 p_1)$

C. $2(q_1 p_2 + q_2 p_3 + p_3 q_1)$

D. none

Answer: A

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202. The quadratic equation $x - 6x + a = 0$ 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. 4

B. 3

C. 2

D. 1

Answer: C

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203. If $x^2 + bx + ca = 0, x^2 + cx + ab = 0$ have a common root then their other are the roots of the equation

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

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

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

D. none

Answer: B

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204. IF $x^2 + px + q = 0$ and $x^2 + qx + p = 0$ have a common root , then their other roots are the roots of

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

B. $x^2 - x - pq = 0$

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

D. none

Answer: A

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205. IF $(x - 2)$ is a common factor of the expression $x^2 + ax + b$ and $x^2 + cx + d$ then $\frac{b - d}{c - a} =$

A. -2

B. -1

C. 1

D. 2

Answer: D

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206. IF α, β are the roots of $ax^2 + bx + c = 0, \alpha_1, -\beta$ the roots of $a_1x^2 + b_1x + c_1 = 0$ then α, α are the roots of the equation

A. $\left(\frac{b}{a} + \frac{b_1}{a_1}\right)^{-1}x^2 + x\left(\frac{b_1}{c_1} + \frac{b}{c}\right)^{-1} = 0$

B. $\left(\frac{b}{a} - \frac{b_1}{a_1}\right)^{-1}x^2 - x\left(\frac{b_1}{c_1} + \frac{b}{c}\right)^{-1} = 0$

C. $\left(\frac{b}{a} + \frac{b_1}{a_1}\right)^{-1} x^2 - x\left(\frac{b_1}{c_1} + \frac{b}{c}\right)^{-1} = 0$

D. none

Answer: A

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207. The values of the parameter a for which the quadratic equation $(1 - 2a)x^2 - 6ax - 1 = 0$ and $ax^2 - x + 1 = 0$ have at least one root in common are

A. $0, 1/2$

B. $1/2, 2/9$

C. $2/9$

D. $0, 1/2, 2/9$

Answer: C

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208. IF $x^2 + ax + b, x^2 + cx + d$ has the common factor x-1 then $a + b - c - d =$

A. 0

B. 1

C. -1

D. none

Answer: A

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209. If $ax^2 + 2bx + c = 0$,$a_1x^2 + 2b_1x + c_1 = 0$ have a common root , then the roots of the equation $\left(b^2 - ac\right)x^2 + \left(2bb_1 - aa_1 - a_1c\right)x + \left(b_1^2 - a_1c_1\right)$ =0 are

A. different

B. equal

C. zero

D. none

Answer: B

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210. IF $ax^2 + 2bx + c = 0$, and $px^2 + 2qx + r = 0$

A. b^2 - ac and q^2 - pr are both perfect squares

B. b^2 - ac is perfect square and q^2 - pr is not a perfact square

C. q^2 - pr is a pefect square and b^2 - ac is not a perfect square

D. both b^2 - ac and q^2 - pr are not perfect squares

Answer: A

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211. if P,q, r, s $\in$ R such that $pr = 2(q + s)$ then

A. both the equation $x^2 + px + q = 0, x^2 + rx + s = 0$ have real roots

B. one of the equation $x^2 + px + q = 0, x^2 + rx + s = 0$ must have real roots

C. Both the equations $x^2 + px + q = 0, x^2 + rx + s = 0$ cannot have real roots

D. none

Answer: B

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212. IF every pair from the equation $x^2 + px + qr = 0, x^2 + qx + rp = 0$ and $x^2 + rx + pq = 0$ has a common root , them the product of three common roots is

A. pqr

B. 2pqr

C. $p^2q^2r^2$

D. none

Answer: A

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213. IF the equation $k\left(6x^2+3\right)+rz+2x^2-1=0$ and $6k\left(2x^2+1\right)+px+4x^2-2=0$ have both the root common , then the value of $2r-p$ is

A. 0

B. 1

C. 2

D. 3

Answer: A

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214. The equation $ax^2 + bx + a = 0(a, b, \in R)$ and $x^3 - 2x^2 + 2x - 1 = 0$ have two roots common . Then a+ b must be equal to

A. 1

B. -1

C. 0

D. one of these

Answer: C

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

A. -2

B. -1

C. 1

D. 2

Answer: A

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216. IF α, β are the roots of $x^2 + px + q = 0$ and also of $x^{2n} + P^n x^n + q^n = 0$ and if $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$ are the roots of $x^n + 1 + (x+1)^n = 0$ then n is

A. an odd integer

B. en even integer

C. any integer

D. none of these

Answer: B

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

A. a^2, b^2, c^2 are in A.P

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

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

D. none of these

Answer: B

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218. If $12^{4+2x^2} = \left(24\sqrt{3}\right)^{3x^2-2}$, then x =

A. $\pm\sqrt{\dfrac{13}{12}}$

B. $\pm\sqrt{\dfrac{14}{5}}$

C. $\pm\sqrt{\dfrac{12}{13}}$

D. $\pm\sqrt{\dfrac{5}{14}}$

Answer: B

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219. for the equation $|x|^2 + |x| - 6 = 0$ the roots are

A. One and only one real number

B. real with sum one

C. real with sum zero

D. real with porduct zero

Answer: C

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220. The number of real solution $x^2 - 7|x| + 12 = 0$ is

A. 4

B. 3

C. 2

D. 10

Answer: A

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221. The number of real roots of $\left|x^2\right| - 5|x| + 6 = 0$ is

A. 2

B. 3

C. 4

D. 1

Answer: C

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222. If $\left|x^2\right| + |x| - 2 = 0$ then x=

A. ± 1

B. ± 3

C. ± 11

D. ± 15

Answer: A

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223. The product and sum of the roots of the equation $\left|x^2\right| - 5|x| - 24 = 0$ are respectively

A. $-64, 0$

B. $-24, 5$

C. $5, \ -24$

D. $0, 72$

Answer: A

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224. The real roots of the equation $\left|x^2 + 4x + 3\right| + 2x + 5 = 0$ are

A. $4, \ -1 + \sqrt{3}$

B. $-4, \ -1 - \sqrt{3}$

C. $\pm 41 \pm \sqrt{3}$

D. $-2, \ -4-1\sqrt{3}$

Answer: B

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225. The number of real solutions of the equation $\left|x\ |^{2}-5\ |\ x\ |\ +6=0\right.$is

A. 4

B. 1

C. 3

D. 2

Answer: A

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226. The solutions of $\left|x^2 - 2x + 2\right| = 3x - 2$ are

A. $4, \ -1$

B. $-4, \ -1$

C. $-4, 1$

D. $4, 1$

Answer: D

Watch Video Solution

227. IF $|x - 2| + 2|x - 9| = 7$ then x=

A. any real number between 0.7

B. any real number between 2.9

C. any real number between 2.7

D. any real number between 0.9

Answer: B

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228. IF $|x - 2| + 2|x - 3| = 7$ then x=

A. $2 \text{ or } 1/3$

B. 3 or $1/7$

C. $2 \text{ or } 1/5$

D. none

Answer: D

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229. If $|x+1| - |x| + 3|x-1| - 2|x-2| = x+2$, then x=

A. $x = 2 \text{ or } x \leq 2$

B. $x = -5 \text{ or } x > 5$

C. $x = -2 \text{ or } x \geq 2$

D. none of these

Answer: C

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230. The number of real roots of $\left(7+4\sqrt{3}\right)^{|x|-8}=14$ is

A. 0

B. 2

C. 4

D. none of these

Answer: D

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231. The sum of all real values of x satisfying the equation $\left(x^2 - 5x + 5\right)^{x^2 + 4x - 60} = 1$ is

A. 3

B. -4

C. 6

D. 5

Answer: A

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232. The product of real roots of the equation $|x|^{6/5} - 26|x|^{3/5} - 27 = 0$ is

A. -3^{10}

B. -3^{12}

C. $-3^{12/5}$

D. $-3^{21/5}$

Answer: A

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233. IF α is a root of the equation $4x^2 + 2x - 1 = 0$ then $4\alpha^3 - 3\alpha$ is

A. a root

B. not a root

C. may be a root

D. none

Answer: A

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234. The value of the continued fraction $1 + \dfrac{1}{1 + \dfrac{1}{1 + \ldots.}}$ is

A. $\dfrac{\sqrt{5} - 1}{2}$

B. $\dfrac{\sqrt{5} + 1}{2}$

C. $\dfrac{\sqrt{5} - 1}{2}$

D. $\dfrac{\sqrt{5} + 1}{3}$

Answer: B

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235. IF $20^{3-2x^2} = \left(40\sqrt{5}\right)^{3x^2-2}$, then x=

A. $\pm\sqrt{\frac{13}{12}}$

B. $\pm\sqrt{12/13}$

C. $\pm\sqrt{4/5}$

D. $\pm\sqrt{5/4}$

Answer: B

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236. If $x + \sqrt{x} = 6/25$ then x=

A. $1/5$

B. $1/25$

C. $1/625$

D. $1/125$

Answer: B

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237. IF $\sqrt{x + 1}$ - $sqt(x - 1) = 1$ then x=

A. $7/11$

B. $2/3$

C. $5/4$

D. $-(3/2)$

Answer: C

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238. The solution set of $\sqrt{x+1}+\sqrt{2x-5}=3$ is

A. {2}

B. {3}

C. {4}

D. {5}

Answer: B

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239. If $\sqrt{x + 2} = \sqrt{3x - 10}$, then x=

A. -6

B. 6

C. 3

D. -3

Answer: B

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240. The solution set of $\sqrt{x + 20} + \sqrt{x + 4} = 4\sqrt{x - 1}$ is

A. {2}

B. {3}

C. {4}

D. {5}

Answer: D

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241. IF $\sqrt{3x - 5} = 0$ then x=

A. 2

B. -2

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

D. none

Answer: C

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242. IF $x^2 - 4x - 12\sqrt{x^2 - 4x + 19} + 51 = 0$ then x=

A. $1 \text{ or } 3 \text{ or } -5 \text{ or } 9$

B. $2 \text{ or } -3 \text{ or } 5 \text{ or } 7$

C. $-3 \text{ or } 1 \text{ or } -7$

D. none

Answer: A

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243. IF $\sqrt{x^2 + 4a + 5} + \sqrt{x^2 + 4b + 5} = 2(a - b)$ then x=

A. $\dfrac{(a - b)^2 - 5}{2(a + b)}$

B. $\dfrac{a^2 - b^2}{2(a + b)}$

C. $\dfrac{(a + b)^2}{(a + b) - 5}$

D. none

Answer: A

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244. the solution set of $x^2 + x - 2 = 0$ is

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245. IF $2x^{1/3} + 2x^{-1/3}$=5 then x=

A. $3 \text{ or } 1/9$

B. $5 \text{ or } 1/5$

C. $2 \text{ or } 1/5$

D. $8 \text{ or } 1/8$

Answer: D

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246. IF $(a + x)^{2/3} + (a - x)^{2/3} = 4\left(a^2 - x^2\right)^{1/3}$ then x=

A. $\pm \frac{3a}{4\sqrt{4}}$

B. $\pm \frac{4a}{3\sqrt{3}}$

C. $\pm \frac{5a}{3\sqrt{3}}$

D. $\pm \frac{5a}{6\sqrt{6}}$

Answer: C

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247. The number of rational roots of $(2x + 3)(2x + 5)(x - 1)(X - 2) = 30$ is

A. 4

B. 3

C. 2

D. 5

Answer: C

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248. The solution set of $(x - 1)(X - 3)(x - 5)(x - 7) = 9$ is

A. $\{-4, 4, 4 \pm \sqrt{10}\}$

B. $\{4, 4, 4 \pm \sqrt{10}\}$

C. $\{-4, -4, 4 \pm \sqrt{10}\}$

D. none

Answer: B

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249. The roots of $\frac{1}{(x-1)_1}/(x-2)=\frac{1}{x-3}$ are

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

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

C. $6 \pm \sqrt{8}$

D. $8 \pm \sqrt{6}$

Answer: A

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250. The equation $x-\frac{2}{x-1}=1-\frac{2}{x-1}$ has

A. no root

B. one root

C. two root

D. infinitely many roots

Answer: A

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251. If $\frac{x}{b}+\frac{b}{x}=\frac{a}{b}+\frac{b}{a}$ then x=

A. a^2 or b^2/a^3

B. a or b^2/a

C. a^2 or b/a

D. a or b^2/a^2

Answer: B

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252. A root of the equation $\frac{a+c}{x+a}+\frac{b+c}{x+b}=\frac{2(a+b+c)}{x+a+b}$ is

A. a

B. b

C. c

D. a+b+c

Answer: C

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253. The solution set of $\left(x+\frac{1}{x}\right)^2-\frac{3}{2}\left(x-\frac{1}{x}\right)=4$ when $x \neq 0$ is

A. {1/2,1,1,2}

B. {-1/2,-1/2,-1,1,2}

C. { 1/2 ,-1,1,2}

D. {-1/2,1,1,2}

Answer: B

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254. Solve $2\left(x+\frac{1}{x}\right)^{2}-7\left(x+\frac{1}{x}\right)+5=0, \text{ when } x \neq 0$

A. $\left\{2 \pm \frac{1}{2}, \frac{1 \pm i\sqrt{3}}{2}\right\}$

B. $\left\{2, -\frac{1}{2}, \frac{1 + I\sqrt{3}}{2}\right\}$

C. $\left\{-2, \frac{1}{2}, \frac{1 \pm i\sqrt{3}}{2}\right\}$

D. none

Answer: A

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255. Solve $\left(x^{2}+\frac{1}{x^{2}}\right)-5\left(x+\frac{1}{x}\right)+6=0, \text{ when } x \neq 0$

A. $\left\{2 \pm \frac{\sqrt{3}}{2}\right\}$

B. $\left\{2, -\frac{1}{2}, \frac{1 + I\sqrt{3}}{2}\right\}$

C. $\left\{-2 \pm \sqrt{3}, \frac{1 + I\sqrt{3}}{2}\right\}$

D. none

Answer: A

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256. If $\frac{\sqrt{1 + x^2} + \sqrt{1 - x^2}}{\sqrt{1 + x^2} - \sqrt{1 - x^2}} = 3$ then x=

A. $\sqrt{2/3}$

B. $\sqrt{1/3}$

C. $\sqrt{\frac{2}{5}}$

D. $\sqrt{3/5}$

Answer: D

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257. IF $\dfrac{x+\sqrt{12a-x}}{x-\sqrt{12a-x}}=\dfrac{\sqrt{a}+1}{\left(\sqrt{a}-1\right)}$, then x=

A. $2a^2$

B. $4a$

C. $3a$

D. $3a^2$

Answer: C

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258. IF $\sqrt{\frac{x}{1-x}}+\sqrt{\frac{1-x}{x}}=2\frac{1}{6}$ then x=

A. 4 / 11 or 7 /11

B. 3/11 or 5 /11

C. 4/13 or 9 /13

D. none

Answer: C

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259. $\sqrt{\frac{x}{x - 3}} + \sqrt{\frac{x - 3}{x}} = \frac{5}{2}$, when $x \neq 0$ and $x \neq 3$

A. $\{1, 2\}$

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

C. $\{1, 5\}$

D. $\{4, -1\}$

Answer: D

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260. $\sqrt{\frac{3x}{x + 1}} + \sqrt{\frac{x + 1}{3x}} = 2$, when $x \neq 0$ and $x \neq -1$

A. $\{1/2\}$

B. $\{1\}$

C. $\{2\}$

D. $\{3\}$

Answer: A

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261. If $2^{x} + 27\left(2^{-x}\right) = 12$ then x=

A. $\log_2 3$ or $2\log_2 3$

B. $\log_2 5$ or $2\log_2 3$

C. $\log_2 7$ or $\log_2 5$

D. none

Answer: A

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262. If $3^{2x} - 3^{x+1} - 3^{x-1} + 1 = 0$ then x=

A. 0

B. ± 7

C. ± 1

D. ± 3

Answer: C

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263. Solve $7^{1+x} + 7^{1-x} = 50$ for real x.

A. $\{1, 1\}$

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

C. $\{-1, 1\}$

D. none

Answer: B

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264. IF $e^{\left(\cos^2 x + \cos^4 + \cos^6 x + \dots\right)\log 3}$ satissfies $y^2 - 10y + 9 = 0$ and $(0 < x < \pi/2)$ then $\cot^2 x =$

A. 0

B. 1

C. $1/2$

D. 9

Answer: A

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265. The equation $x^{(3/4)}\left(\log_2 x\right)^2 + \log_2 x - 5/4 = \sqrt{2}$ has

A. exactly two real roots

B. no real root

C. one irrational root

D. one of these

Answer: C

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266. The number of real of the equation $\frac{2x - 3}{x - 1} + 1 = \frac{6x^2 - x - 6}{x - 1}$ is

A. 0

B. 1

C. 2

D. none

Answer: B

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267. The equation $e^{\sin x} - e^{-\sin x} - 4 = 0$ has

A. 0

B. 1

C. 4

D. ∞

Answer: A

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268. The number of solutions of the system of equation given below is :

A. ∞

B. 2

C. 4

D. 8

Answer: D

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269. The number of solution of the equation $9x^2 - 18|x| + 5 = 0$ belonging to the domin of $\log_e\{(x+1)(x+2)\}$ is

A. 1

B. 2

C. 3

D. 4

Answer: C

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270. The number of solutions of the equation $5^{x} + 5^{-x} = \log_{10}25, x \in R$ is

A. 0

B. 1

C. 2

D. infinitely many

Answer: A

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271. IF the equation ax+by=1, $cx^2 + dy^2 = 1$ have only one solution then $\frac{a^2}{c} + \frac{b^2}{d} =$

A. 1

B. -1

C. 0

D. 2

Answer: A

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272. If a+b+c=0 then the quadratic equation $3ax^2 + 2bx + c = 0$ has at least one root in

A. $[1, 2]$

B. $[0, 1]$

C. $[-1, 1]$

D. $[1, 3]$

Answer: B

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273. If $2a + 3b + 6c = 0$ then the equation $ax^2 + bx + c = 0$ has atlest one root in

A. $(0, 1)$

B. $(1, 1)$

C. $[-1, 1]$

D. $[1, 2]$

Answer: A

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274. Let P(x) be a polynomial with integral coefficients . If there exists two intefers a and b such that p(a) - p(b) =1 then

A. both a and b must be even

B. both a and b must be odd

C. a and b are two consecutive intergers

D. none of these

Answer: C

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275. IF 0< a

A. real and distinct roots out of which one lies between c and d

B. real and distinct roots out of which one lies between a and b

C. real and distinct roots out of which one lies between b and c

D. non - real roots

Answer: A

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276. α and β are the roots of the equation $x^2 + px + p^3 = 0, (p \neq 0)$. If the point (α, β) lies on the curve $x = y^2$, then the roots of the given equaion are

A. $4, \ -2$

B. $4, 2$

C. $1, \ -1$

D. $1, 1$

Answer: A

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277. Find all number which exceed their square root by 12

A. 8

B. 16

C. 24

D. 32

Answer: B

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278. The two consecutive positive odd integers such that the sum of their squares is 290 are

A. 5, 7

B. 9, 11

C. 11, 13

D. 15, 17

Answer: C

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279. Find two consecutive positive even integers, the sum of whose squares is 340.

A. 10, 20

B. 12, 14

C. 14, 18

D. 16, 20

Answer: B

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280. The number having two digits such that it is 4 times the sum and three times the product of its two digits are

A. 8

B. 16

C. 24

D. 32

Answer: C

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281. A number of two digit s whose product is 30 . If the digits are interchanged the resulting number will exceed the previous by 9. the number is

A. 56

B. 54

C. 38

D. 28

Answer: A

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282. The sum of the ages of a father and a son is 45 years . Five years ago the product of their ages was four times the father's age at that time . Their present ages are

A. 32, 8

B. 28, 7

C. 36, 9

D. 40, 10

Answer: C

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283. The cost of a piece of cable wire is Rs. 35/-, If the length of the piece of wire is 4 meters more and each meter costs, Rs. 1/- less, the cost would remain unchanged. What is the length of the wire ?

A. 10 metres

B. 12 metes

C. 15 metres

D. 20 metres

Answer: A

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284. One fourth of a herd of goats was seen in the forest. Twice the square root of the number in the herd had gone up the hill and the remaining 15 goats were on the bank of the river. Find the total number of goats.

A. 26

B. 28

C. 34

D. 36

Answer: D

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285. In the interior of a forest there are some apes . Of their total number square of $\frac{1}{9}$ th are playing at one place . The remaining are on the hills . The total number of apes is

A. 27 or 54

B. $16 \text{ or } 32$

C. $28 \text{ or } 56$

D. 185 or 36

Answer: A

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286. In a cricket match Anil took one wicket less than twice the number of wickets taken by Ravi. If the product of the number of wickets taken by them is 15, find the number of wickets taken by each of them.

A. 5, 3

B. 3, 5

C. 2, 6

D. 7, 9

Answer: A

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287. Some points on a plane are marked and they are connected pair wise by line segments . IF the total number of line segments formed is 10 then the number of marked points on the plane is

A. 2

B. 3

C. 4

D. 5

Answer: D

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288. The sides of a right angled triangle containing the right angle are 5x cm and (3x-1) cm . If the area of the triangle is 60 sq . Cm the length of the sides of the triangles are

A. 8 cm , 15 cm , 17 cm

B. 6cm , 12 cm , 18 cm

C. 10 cm , 18 cm , 20 cm

D. 9 cm , 116 , 24 cm

Answer: A

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Exercise 1 B Quadratic Expressions

1. If $x < 3$ or $x > 4$ then the value of x^2 - $7x + 12$ is

A. zero

B. positive

C. negative

D. not determined

Answer: B

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2. IF $x \in R$ then the value of x^2 - $6x + 10$ is

A. zero

B. positive

C. negative

D. not determined

Answer: B

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3. IF -$1/2 < x < 3$ then the value of ` 2x ^2 - 5 x -3 is

A. zero

B. positive

C. negative

D. not determined

Answer: C

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4. if $x \neq 3/2$ then the value of $4x^2 - 12x + 9$ is

A. zero

B. positive

C. negative

D. not determined

Answer: B

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5. IF $x \in R$ then the value of $4x - x^2 - 6$ is

A. zero

B. positive

C. negative

D. not determined

Answer: C

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6. IF $4 < x < 8$ then the value of $-7x^2 + 8x - 9$ is

A. zero

B. positive

C. negative

D. not determined

Answer: C

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7. If $x \in R$ then the value of $-7x^2 + 9x - 9$ is

A. zero

B. positive

C. negative

D. not determined

Answer: C

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8. if $a > 0$ and $b^2 - 4ac = 0$, then the curve $y = ax^2 + bx + c$

A. Cuts the x- axis

B. touches the x- axis lies below it

C. lies entirely above the x- axis

D. touches the x- axis and lies above it

Answer: D

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9. $x^2 - 2x + 10$ has minimum at x=

A. 2

B. -1

C. 1

D. -2

Answer: C

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10. $3x - 5x^2 + 12$ has maximum at x=

A. $2/5$

B. $-1/5$

C. $3/10$

D. $-3/10$

Answer: C

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11. if $2x - 7 - 5x^2$ has maximum value at $x = a$ then a=

A. $-1/5$

B. $1/5$

C. $34/5$

D. $-34/5$

Answer: B

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12. the minimum value of $x^2 - 8x + 17, \forall x \in R$ is

A. 17

B. -1

C. 1

D. 2

Answer: C

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13. The maximum value of $10x - 5x^2 - 1$ is

A. -1

B. $-1/5$

C. 2

D. 4

Answer: D

Watch Video Solution

14. the maximum value of $(x - a)(b - x)$ is

A. $\left(a^2 - b\right)^2/4$

B. $(a - b)^2$

C. a

D. b

Answer: A

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15. The maximum value of $a^2 - abx - b^2x^2$ is

A. $5a^2/4$

B. $a^2/2$

C. a

D. $-a$

Answer: A

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16. the minimum value of $\left(x - \frac{5}{3}\right)^2 + \frac{7}{2}$ is

A. 1

B. 7

C. $7/5$

D. $7/2$

Answer: D

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17. the maximum value of $\frac{7}{5} - \left(x - \frac{2}{3}\right)^2$ is

A. $11/3$

B. $7/5$

C. 7

D. 5

Answer: B

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18. the maximum value of $c + 2bx - x^2$ is

A. b^2c

B. b^2 - c

C. c - b^2

D. $b^2 + c$

Answer: D

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19. the minimum value of the quadratic expression $x^2 + 2bx + c$ is

A. cb^2

B. c^2b

C. $c + b^2$

D. $c - b^2$

Answer: D

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20. the expression $2x^2 + 4x + 7$ has minimum value m at $x = \alpha$. The ordered pair (α, m) is

A. $(1, 5)$

B. $(1, -5)$

C. $(-1, -5)$

D. $(-1, 5)$

Answer: D

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21. The extreme value of $x^2 - 5x + 6$ is

A. $1/4$

B. $-1/4$

C. $1/2$

D. $-1/2$

Answer: B

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22. Find the changes in the sign of the following expressions and find their extreme values.

$15 + 4x - 3x^2$

A. $49/3$

B. $-49/3$

C. $47/3$

D. $-47/3$

Answer: A

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23. If $a_1, a_2, \dots a_n$ are in H.P. then

$a_1 . a_2 + a_2 . a_3 + a_3 . a_4 + \dots + a_{n-1} . a_n =$

A. $a_1 + a_2 + \ldots + a_n$

B. $\left(a_1 + a_2 + a_3 + \ldots + a_n\right)$

C. $n\left(a_1 + a_2 + \ldots + a_n\right)$

D. none

Answer: D

Watch Video Solution

24. IF a,b,c are positive then the least value of $(a + b + c)(1/a + 1/b + 1/c)$ is

A. 4

B. 3

C. 7

D. 9

Answer: D

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25. If a,b,c are distinct positive numbers then the 3expression $(b + c - a)(c + a - b)(a + b - c) - abc$ is

A. positive

B. negative

C. nonpositive

D. nonnegative

Answer: C

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26. IF $a^2 + b^2 + c^2 = 1$ then the range of $ab + bc + ca$ is

A. $[1/2, 2]$

B. $[-1/2]$

C. $[-1/2, 1]$

D. $[1, 3/2]$

Answer: C

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27. In triangle ABC, range of $\frac{a^2+b^2+c^2}{ab+bc+ca}$ is (a,b,c are sides of triangle)

A. [1,2)

B. $(-\infty, 1] \cup [2, \infty)$

C. zero

D. none

Answer: A

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28. The solution set of $-x^2+3x+4>0$ is

A. $(-1, 4)$

B. $(-\infty, -3] \cup [7, \infty)$

C. $(-\infty, 3) \cup (5, \infty)$

D. $[-4, 1]$

Answer: A

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29. the solution set of $x^2 - 4x - 21 \geq 0$ is

A. $(-1, 4)$

B. $(-\infty, -3] \cup [7, \infty)$

C. $(-\infty, 3) \cup (5, \infty)$

D. $[-4, 1]$

Answer: B

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30. the solution set of $1 \leq x^2 - 2x$ is

A. $\left(-\infty, 1-\sqrt{2}\right] \cup \left[1+\sqrt{2}, \infty\right)$

B. $(-\infty, -3) \cup \left(1+\sqrt{2}, \infty\right)$

C. $(-1, 1/2)$

D. $[-1, 1/2]$

Answer: A

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31. the solution set of $x^2 > 4x + 5$ is

A. $\left(-\infty 1\sqrt{2}\right] \cup \left[1+\sqrt{2}, \infty\right)$

B. R

C. $(-1, 1/2)$

D. $[-1, 1/2]$

Answer: B

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32. The solution set of $2x^2 - 4x + 5 > 0$ is

A. $[-1/2, 3]$

B. R

C. $(-2, 1/2)$

D. ϕ

Answer: D

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33. the solution set of $x^2 - 2x + 2 < 0$ is

A. $[-1/2, 3]$

B. R

C. $(-2, 1/2)$

D. ϕ

Answer: D

34. the set of all solutions of the inequation $x^2 - 2x + 5 \leq 0$ in R is

A. $R - (-\infty, -5)$

B. $R - (5, \infty)$

C. ϕ

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

Answer: C

35. The set of solutions of $|x|^2 - 5|x| + 4 < 0$ is

A. $(-4, -1)$

B. $(1, 4)$

C. $(-4, -1) \cup (1, 4)$

D. $(-4, 4)$

Answer: C

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36. if the expression $4x - 5x^2 + 1$ is positive if x lies in

A. $(-1/5, 1)$

B. $(1, 1)$

C. ϕ

D. R

Answer: A

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37. the expression $-7x^2 + 8x - 9$ is positive if x lies in

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

B. $(-\infty, 2) \cup (3, \infty)$

C. ϕ

D. R

Answer: C

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38. the expression $x^2 - 5x - 6$ is negative is x lies in

A. $(- 1, 6)$

B. $(2, 5)$

C. $(- 3, 1/2)$

D. R

Answer: A

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39. The greatest positive integral value of x for which 200-x (10 + x) is positive is

A. 11

B. 10

C. 9

D. none

Answer: C

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40. The least integral value of x for which 33-x (2+3x)gt 0\` is

A. -11

B. -3

C. -2

D. -1

Answer: B

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41. The integer k for which the inequality $x^2 - 2(4k - 1)x + 15k^2 - 2k - 7 > 0$ is valid for any x, is

A. 2

B. 3

C. 4

D. 5

Answer: B

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42. IF the difference between the roots 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. $(- 3, 3)$

B. $(- 3, \infty)$

C. $(3, \infty)$

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

Answer: A

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43. IF $x^2 + 6x - 27 > 0 - x^2 + 3x + 4 > 0$ then x lies in the interval

A. $(3, 4)$

B. $[3, 4]$

C. $(-\infty, 3] \cup [4, \infty)$

D. $(-9, 4)$

Answer: A

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44. The set of values of x for which the inequalities $x^2 - 3x - 10 < 0, 10x - x^2 - 16 > 0$ hold simultancously , is

A. $(-2, 5)$

B. $(2, 8)$

C. $(-2, 8)$

D. $(2, 5)$

Answer: B

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45. The set of values of x for which the inequalities $x^2 - 2x + 3 > 0, 2x^2 + 4x + 3 > 0$ hold simultancously , is

A. $(-4, 1)$

B. $(-4, -3] \cup [-2, 1)$

C. $(-4, -3) \cup (-2, 1)$

D. R

Answer: D

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46. IF $x^2 - 2x + 3 > 0, 2x^2 + 4x + 3 > 0$ then x lies in the interval

A. $(1, 2)$

B. R

C. $(2, 5)$

D. ϕ

Answer: B

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47. the greatest negative integer satifying $x^2 - 4x - 77 < 0$ and and x^2 gt4` is

A. 1

B. 2

C. 3

D. -3

Answer: D

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48. If $x > 0$ then the least value of $x + \frac{1}{x}$ is

A. 2

B. -2

C. 1

D. 0

Answer: A

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49. the least value of $\cos^2 x + \sec^2 x$ is

A. 0

B. -2

C. 2

D. -1

Answer: C

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50. The range of $\dfrac{x^2 + 2x + 1}{x^2 + 2x - 1}$ is

A. $(-\infty, 0] \cup (1, \infty)$

B. $[1/2, 2]$

C. $(-\infty, -2/9] \cup (1, \infty)$

D. $(-\infty, -6) \cup (-2, \infty)$

Answer: A

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51. The range of $\dfrac{x^2 - 2x + 9}{x^2 + 2x + 9}$ is

A. $(-\infty, 0] \cup (1, \infty)$

B. $[1/2, 2]$

C. $(-\infty, -2/9] \cup (1, \infty)$

D. $(-\infty, -6) \cup (-2, \infty)$

Answer: B

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52. The range of $\dfrac{x^2 - 2x + 3}{x^2 - 2x - 8}$ is

A. $[-9/2, 1/2]$

B. $(-\infty, 1] \cup [2, \infty)$

C. $(-\infty, -9] \cup [-1, \infty)$

D. R

Answer: C

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53. The range of $\frac{x^2 - 2x + 3}{x^2 - 2x - 8}$ is

A. $[-9/2, 1/2]$

B. $(-\infty, 1] \cup [2, \infty)$

C. $(-\infty, -9] \cup [-1, \infty)$

D. R

Answer: D

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54. IF x is real then the value of $\frac{x^2 - 3x + 4}{x^2 + 3x + 4}$ lies in the interval

A. $\left[\frac{1}{3}, 3\right]$

B. $\left[\frac{1}{5}, 5\right]$

C. $\left[\frac{1}{6}, 6\right]$

D. $\left[\frac{1}{7}, 7\right]$

Answer: D

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55. Show that none of the values of the function $\frac{x^2 + 34x - 71}{x^2 + 2x - 7}$ over R lies between 5 and 9.

A. does not lie

B. lies

C. none

D. cannot be determined

Answer: A

Watch Video Solution

56. IF x is real , then $\frac{x^2 - bc}{2x - b - c}$ has _____ values between b and c

A. no real

B. real

C. none

D. cannot be determined

Answer: A

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57. If x is real then $y = \dfrac{2x^2 + 6x + 5}{x^2 + 3x + 2}$ ____ between -2 and +2

A. lies

B. does not lie

C. none

D. cannot be determined

Answer: B

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58. If x is real, then the minimum value of $y = \dfrac{x^2 - x + 1}{x^2 + x + 1}$ is

A. $1/3$

B. 3

C. $1/2$

D. 1

Answer: A

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59. the (relative) minimum value of $\frac{x^2 - 3x + 2}{x^2 + 3x + 2}$ is

A. $-1/11$

B. $-17 + 12\sqrt{2}$

C. $-17 - 12\sqrt{2}$

D. 0

Answer: B

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60. For $x \in R$, the least value of $\frac{x^2 - 6x + 5}{x^2 + 2x + 1}$ is

A. -1

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

C. $-\frac{1}{4}$

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

Answer: D

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61. If x $\in$ R, then the range of $\frac{x}{x^2 - 5x + 9}$ is

A. $-1/11$

B. -1

C. $1/11$

D. 1

Answer: D

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62. If x is real , then the maximum value of $\frac{x^2+14x+9}{x^2+2x+3}$ is

A. 2

B. 4

C. 6

D. 8

Answer: B

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63. the limits of $\dfrac{6x^2 - 18x + 21}{6x^2 - 18x + 17}$ are

A. $1, 15/7$

B. $1, 15$

C. $2, 3/5$

D. $1, 7/15$

Answer: A

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64. If x is real, then the range of $\dfrac{x^2 + 2x + 1}{x^2 + 2x + 7}$ is

A. 0, 1

B. 1, 2

C. 0, 2

D. 2, 3

Answer: A

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65. IF $\frac{x-a}{x^2-3x+2}$ takens all real values for x $\in R$, then

A. $a = 2$

B. $a < 2$

C. $1 < a < 2$

D. $1 \leq a \leq 2$

Answer: D

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66. IF $x \in R$ then $\frac{x^2 + 2x + a}{x^2 + 4x + 3a}$ can take all real values if

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

B. $a \in [0, 1]$

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

D. none

Answer: B

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67. If $Y = \tan x \cot 3x, x \in R,$ then

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

B. $\frac{1}{3} \leq y \leq 1$

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

D. none

Answer: D

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68. IF $x \in R$ then $\frac{2a(x - 1)\sin^2\alpha}{x^2 - \sin\alpha}$ connot lie between

A. $a\sin^2\alpha, a\cos^2\alpha$

B. $a\sin^2(\alpha/2)a, \cos^2(\alpha/2)$

C. $2a\sin^2\alpha, 2a\cos^2\alpha$

D. $2a\sin^2\left(\alpha/2, 2a\cos^2(\alpha/2)\right.$

Answer: D

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69. If $a \neq b$ then the expression $x^2 - (a+b)x + \left(a^2 - ab + b^2\right)$ ___ negative values for any real value of x

A. does not take

B. take

C. none

D. cannot be determined

Answer: A

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70. If α, β are the roots of $x^2 - (a - 2)x - (a + 1) = 0$ where a is a variable then the least value of $\alpha^2 + \beta^2$ is

A. 2

B. 3

C. 5

D. 7

Answer: C

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71. IF the sum of the squares of the roots of the equation $x^2 - (\sin\alpha - 2)x - (1 + \sin\alpha) = 0$ is least , then α=

A. $\pi/4$

B. $\pi/3$

C. $\pi/2$

D. $\pi/6$

Answer: C

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

A. 0

B. 1

C. 2

D. 3

Answer: B

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73. IF the roots of the equation $bx^2 + cx + a = 0$ be imaginary , then for all real values of x , the experssion $3b^2x^2 + 6bcx + 2c^2$ is

A. less than 4ab

B. greater than - 4ab

C. less than - 4ab

D. greater than 4 ab

Answer: B

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74. The smallest value of of the constant $m > 0$ for which

$f(x) = 9mx - 1 + \frac{1}{x} \geq 0$ for all $x > 0$, is

A. $\frac{1}{9}$

B. $\frac{1}{16}$

C. $\frac{1}{36}$

D. $\frac{1}{81}$

Answer: C

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75. The real values of a for which $y = \sqrt{\frac{(x + 1)(x - 3)}{x - 2}}$ takes real values are

A. $-1 \leq x < 2$ or $x \geq 3$

B. $1 < x < 2$ or $x > 2$

C. $x < 2$ or $x > 3$

D. $x > 2$

Answer: A

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76. IF $x > -c$ then the minimum value of $\dfrac{(a+x)(b+x)}{c+x}$ is

A. $\sqrt{a-c}+\sqrt{b-c}$

B. $\sqrt{a-c}-\sqrt{b-c}$

C. $\left(\sqrt{a-c}+\sqrt{b-c}\right)^2$

D. $\left(\sqrt{a-c}-\sqrt{b-c}\right)^2$

Answer: C

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77. IF $x > -c$ then the minimum value of $\dfrac{(a+x)(b+x)}{c+x}$ is

A. $\sqrt{a-c}+\sqrt{b-c}$

B. $\sqrt{a-c}-\sqrt{b-C}$

C. $\left(\sqrt{a-c}+\sqrt{b-c}\right)^2$

D. $\left(\sqrt{a-c}-\sqrt{b-c}\right)^2$

Answer: D

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78. For real x , the function $\frac{(x - a)(x - b)}{x - c}$ will assume all real values provided

A. $a < b < c$

B. $b < c < a$

C. $c < a < b$

D. none of these

Answer: B

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79. The range of values of x which satisfy $5x + 2 < 3x + 8$ and $\frac{x + 2}{x - 1} < 4$ are

A. '(-oo ,1) U(2,3)`

B. $(0, \infty)$

C. $(- \infty, 2)$

D. $(1, 3)$

Answer: A

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80. The range of values of x for which the inequality $\frac{x - 1}{4x + 5} < \frac{x - 3}{4x - 3}$ holds is

A. $(- 4/3, 5/8)$

B. $(- 4/3, 1/2)$

C. $(- 5/4, 3/4)$

D. none

Answer: C

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81. The values of x for which $\frac{x - 1}{3x + 4} < \frac{x - 3}{3x - 2}$ holds , lie in

A. $(- \infty, - 5/4)$

B. $(- 4/3, 2/3)$

C. $(3/4, \infty)$

D. $(- \infty, \ - 5/4 \cup (3/4, \infty)$

Answer: B

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82. $\left\{x \in R: \dfrac{14x}{x+1} - \dfrac{9x-30}{x-4} < 0\right\}$ is equal to

A. $(- 1, 4)$

B. $(1, 4) \cup (5, 7)$

C. $(1, 7)$

D. $(- 1, 1) \cup (4, 6)$

Answer: D

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83. IF the inequation $\sqrt{3x - 8} < -2$ then

A. ϕ

B. $[1, 2]$

C. $[12, \infty)$

D. $(1, 12]$

Answer: A

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84. if the inequation $\sqrt{x + 5 < -x}$ then

A. 5ltxlarr1

B. $-5 < x < 1$

C. $-5 < x < -1$

D. none

Answer: C

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85. If the inequation $\sqrt{x^2 - 18x + 72} < x - 1$ then

A. ϕ

B. $[1, 2)$

C. $[12, \infty)$

D. $(1, 2]$

Answer: C

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86. IF $\sqrt{9x^2 + 6x + 1} < (2 - x)$ then

A. $x \in \left(+ \frac{3}{2}, \frac{1}{4} \right)$

B. $x \in \left(- \frac{3}{2}, \frac{1}{4} \right)$

C. $x \in \left[- \frac{3}{2}, \frac{1}{4} \right)$

D. $x < \frac{1}{4}$

Answer: B

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87. If the inequation $\sqrt{(x+2)(x-5)} > 8 - x$ then x lies in

A. $\left(\frac{74}{36}, \infty\right)$

B. $\left[\frac{74}{13}, \infty\right)$

C. $\left(-\frac{74}{13}, \infty\right)$

D. $\left[-\frac{74}{13}, \infty\right)$

Answer: A

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88. If the inequation $\frac{\sqrt{6 + x - x^2}}{x + 10} \le \frac{\sqrt{(8 - 2x - x^2)}}{2x + 9}$ then

A. $2 \le x \le -1$

B. $-2 \le x \le -1$

C. $2 \le x \le , x = 3$

D. none

Answer: B

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89. if the inequation $\frac{\sqrt{8 - 2x - x^2}}{x + 10} \le \frac{\sqrt{(8 - 2x - x^2)}}{2x + 9}$, then x lies in

A. $[-4, 1] \cup \{2\}$

B. $(-4, 1] \cup \{2\}$

C. $[-4, 1) \cup \{2\}$

D. none

Answer: A

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90. if $x^2 + ky^2 + x - y$ is resolvable into two linear factors then k=

A. -1

B. 1

C. 2

D. 0

Answer: A

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91. If $xy + 2x - 3y - k$ is resolvable into two linear factors then k=

A. -1

B. 4

C. 6

D. -5

Answer: C

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92. IF $x^2 - y^2 + 4x - 6y + k$ is resolvable into two linear factors then k=

A. -1

B. 4

C. 6

D. -5

Answer: D

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93. IF $x^2 + 4xy + 4y^2 + 4x + cy + 3$ can be written as a product of two linear factors , then c=

A. 2

B. 4

C. 6

D. 8

Answer: D

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94. IF $12x^2 - mxy + 3y^2 - 5y^2 - 2$ can be resolvarble into two linear factors then m=

A. ± 6

B. ± 3

C. ± 5

D. ± 7

Answer: D

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95. IF $12^2 - 10xy + 2y^2 + 11x - 5y + k$ is resolvable into two linear factors factors then k=

A. 2

B. 1

C. 0

D. 4

Answer: A

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96. IF $3x^2 + 8xy - ky^2 + 29x - 3y + 18$ is resolvable into two linear factors then k=

A. 2

B. 1

C. 3

D. 4

Answer: C

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97. IF $mx^2 + 7xy - 3y^2 + 4x + 7y + 2$ is resolvable into two linear factors then m=of twp linear factors then the factors are

A. 7

B. 4

C. 2

D. -5

Answer: C

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98. IF $4x^2 + 4xy - ky^2 - 12 - 2y + 8$ can be written as the produ of two linear factors then the factors are

A. $(2x + 3y + 4)(3x + 5y + 2)$

B. $(3y + x + 9)(y - 3x - 2)$

C. $(2x + 3y - 4)(2x - y - 2)$

D. $(x - y + 4), (x - 2y + 5)$

Answer: C

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99. IF $3x^2 + 8xy + 5y^2 + 14x + 22y + 8$ is resolvable into two linear factors then the factors are

A. $(2x + 3y + 4)(3x + 5y + 2)$

B. $(3y + x + 9)(y - 3x - 2)$

C. $(2x + 3y - 4)(2x - y - 2)$

D. $(x - y + 4), (x - 2y + 5)$

Answer: A

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100. Examine $3y^2 - 8xy - 3x^2 - 29x + 3y - 18$ is re-solvable into two linear factors.

A. $(2x + 3y + 4)(3x + 5y + 2)$

B. $(3y + x + 9)(y - 3x - 2)$

C. $(2x + 3y - 4)(2x - y - 2)$

D. $(x - y + 4), (x - 2y + 5)$

Answer: B

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101. The coordition for $ax^2 + 2cxy + by^2 + 2by^2 + 3bx + 2ay + c$ is resolvable into two linear factors is

A. $a^3 + b^3 + c^3 = 3abc$

B. $a^3 + b^3 + c^3 = abc$

C. $a^2 + b^2 + c^2ab + bc + ca$

D. $a^3 + b^3 + c^3 = 27abc$

Answer: A

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102. The condition for $3x^2 + 2pxy + 2y^2 + 2ax - 4y + 1$ can be resolved into two linear factors is

A. $p^2 + 4ap + a^2 + 6 = 0$

B. $p^2 + 4ap + a^2 = 6$

C. $p^2 + 4ap + 2a^2 + 6 = 0$

D. $p^2 + 4ap + 2a^2 = 6$

Answer: C

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103. If $x^2 + 4y^2 - 8x + 12 = 0$ is satified by real values of x nad y then y must lies between

A. $2, 6$

B. $2, 5$

C. $-1, 1$

D. $-2, 1$

Answer: A

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104. If $x^2 + 4y^2 - 8x + 12 = 0$ is satified by real values of x nad y then y must lies between

A. $2, 6$

B. $2, 5$

C. $-1, 1$

D. $-2, 1$

Answer: C

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105. Let f(x) be a polynomial for which the remainders when divided by $x - 1, x - 2, x - 3$ respectively are $3, 7, 13$ then the remainder of f(x) when divided by $(x - 1)(x - 2)(x - 3)$ is

A. $f(x)$

B. $x^2 + X + 1$

C. $x^2 + 1$

D. none

Answer: B

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106. Let two numbers have arthmetic mean 9 geometric mean 4. then these numbers are the roots of the quadratic equation

A. $x^2 + 18x + 16 = 0$

B. $x^2 - 18x - 16 = 0$

C. $x^2 + 18x - 16 = 0$

D. $x^2 - 18x + 16 = 0$

Answer: D

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Exercise 2 Special Type Questionos Set 1

1. I : If $(a\alpha + b)^2 + (a\beta = b)^{-2} = 1$ where α, β are the roots of $ax^2 + bx + c = 0$ then $ac(ac + 2) = b^2$

II : the value of $'a'$ for which one root of the quadratic equation $\left(a^2 - 5a + 3\right)x^2 + (3a - 1)x + 2 = 0$ is twice as large as the quadratic equation

A. Only I is true

B. Only II is true

C. both I and II are true

D. niether I nor II true

Answer: A

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2. I: If $p(q - r)x^2 + q(r - p)x + r(p - q) = 0$ has equal roots then p,q,r in A.P

II : if the sum of the roots of $ax^2 + bx + c = 0$ has equal to the sum of the squares of their reciprocals then $bc^2, ca^2, + bx + c = 0$ is equal to the sum of the squares of their reciproocals then bc^2, ca^2, ab^2 are in A.P

A. Only I is true

B. Only II is true

C. both I and II are true

D. niether I nor II true

Answer: B

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3. I) The maximum value of $c + 2bx - x^2$ is $c + b^2$

II) The minimum value of $x^2 + 2bx + c$ is $c - b^2$

Which of the above statements is true ?

A. Only I is true

B. Only II is true

C. both I and II are true

D. niether I nor II true

Answer: A

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4. E_1, $a+b+c=0$ if 1 is a root of $ax^2+bx+c=0$.

$E_2 : b^2 - a^2 = 2ac$ if $\sin\theta\cos\theta$ are the of $ax^2+bx+c=0$

which of the following is true?

A. E_1 is true E_2 is true

B. E_1 is true E_2 is false

C. E_1 is false ,E_2 is ture

D. E_1 is false E_2 is false

Answer: A

View Text Solution

Exercise 2 Special Type Questionos Set 2

1. a,b,c $\in R\alpha$ is a root of $a^2x^2 + bx + c = 0\beta$ is a root of $a^2x^2 - bx - c = 0$ and γ is a root of $a^2x^2 + 2bx + 2c = 0$ then

A. A,B,C,D

B. B,D,C,A

C. A,C,B,D

D. D,B,A,C

Answer: B

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2. if A, B, C, D are the sum of the roots of the roots of $2x^2 + x + 3 = 0, x^2 - x + 2 = 0, 3x^2 - 2x + 1 = 0, x^2 - x - x + 1 = 0$

then the ascendinf order of A,B,C,D is

A. A,B,C,D

B. B,D,C,A

C. A,C,B,D

D. C,D,A,B

Answer: C

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3. IF A,B,C, are the minimum value of $x^2 - 8x + 17, 2x^2 + 4x - 5, 3x^2 - 7x + 1$ then the ascending order of A,B,C is

A. A,B,C

B. B,C,A

C. C,A,B

D. A,C,B

Answer: B

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4. IF A,B,C are the maximum value of $2x + 5 - x^2, x - 1 - 2x^2, 5x + 2 - 3x^2$ then the descending order of A,B,C is

A. A,B,C

B. B,C,A

C. C,A,B

D. A,C,B

Answer: D

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Exercise 2 Special Type Questionos Set 3

1. IF α, β are the roots of $ax^2 + bx + c = 0$ then the match the following

I. $\alpha\beta^2 + \alpha^2\beta + \alpha\beta =$

II. $\frac{1}{\alpha^2} + \frac{1}{\beta^2} =$

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

IV. $\frac{\alpha^3 + \beta^3}{\alpha^{-3} + \beta^{-3}} =$

a) $\frac{b^2 - 2ac}{c^2}$

b) $\frac{3abc - b^3}{a^2 c}$

c) $\frac{c^3}{a^3}$

d) $\frac{ac - bc}{a^2}$

A. c,d,a,b

B. d,c,b,a

C. d,a,b,c

D. c,b,a,c

Answer: C

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2. Match the following

I. If α, β are the roots of $x^2+5x-4=0$ then the equation whose roots are $\frac{\alpha+2}{3}, \frac{\beta+2}{3}$ is	a) $4x^2+3x-2=0$
II. If α, β are the roots of $2x^2+x+3=0$ then the equation whose roots are $\frac{1-\alpha}{1+\alpha}, \frac{1-\beta}{1+\beta}$ is	b) $3x^2-2x+1=0$
III. If α, β are the roots of $x^2-2x+3=0$ then the equation whose roots are $\frac{\alpha-1}{\alpha+1}, \frac{\beta-1}{\beta+1}$ is	c) $9x^2+3x-10=0$
IV. If α, β are the roots of $2x^2+3x-4=0$ then the equation whose roots are $2\alpha+\frac{3}{\beta}, 2\beta+\frac{3}{\alpha}$ is	d) $2x^2+x+3=0$

A. a,c,d,b

B. d,c,b,a

C. b,c,d,a

D. c,d,a,c

Answer: D

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3. match the following .

Inequation	Solution set
I. $x^2 - 7x + 12 \geq 0$	a) $\varnothing$
II. $x^2 + 3x - 4 \leq 0$	b) $(-2, 1/2)$
III. $2x^2 + 3x < 2$	c) $[-4, 1]$
IV. $x^2 - 2x + 2 < 0$	d) $(-\infty, 3] \cup [4, \infty)$

A. a,c,d,b

B. d,c,b,a

C. b,c,d,a

D. c,d,a,c

Answer: B

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4. Let α and β be the roots of the quadratic equation $ax^2 + bx + c = 0$. Observe the lists given below:

List -I	List-II
i) $\alpha = \beta \Rightarrow$	A) $(ac^2)^{1/3} + (a^2c)^{1/3} + b = 0$
ii) $\alpha = 2\beta \Rightarrow$	B) $2b^2 = 9ac$
iii) $\alpha = 3\beta \Rightarrow$	C) $b^2 = 6ac$
iv) $\alpha = \beta^2 \Rightarrow$	D) $3b^2 = 16ac$
	E) $b^2 = 4ac$
	F) $(ac^2)1/3 + (a^2c)^{1/3} = b$

Let correct match of List -I from List -II is

A. $\begin{matrix} I & ii & iii & iv \\ E & B & D & F \end{matrix}$

B. $\begin{matrix} I & ii & iii & iv \\ E & B & A & D \end{matrix}$

C. $\begin{matrix} I & ii & iii & iv \\ E & D & B & F \end{matrix}$

D. $\begin{matrix} I & ii & iii & iv \\ E & B & D & A \end{matrix}$

Answer: D

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Exercise 2 Special Type Questionos Set 4

1. A: The quadratic equation having roots $3 \pm 2I$ is $x^2 - 6x + 13 = 0$

R : the quadratic equation having roots α, β is $x^2 - (\alpha + \beta)x + \alpha\beta = 0$

A. Both A are R are ture R is the correct explanation Of A

B. Both A are R are true but R is not correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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2. A: the quadratic equation whose roots are the reciprocals of the roots of $3x^2 - 7x + 2 = 0$ is $3x^2 + 7x + 2 = 0$

R : the quadratic equation whose roots are the reciprocals of the roots of the quadratic equation $f(x)$is f(1/x)=0

A. Both A are R are ture R is the correct explanation Of A

B. Both A are R are true but R is not correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: D

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3. A : $x^2 + x + 1 > 0$ for all $x \in R$

R : if the roots of $ax^2 + bx + c = 0$ are imaginary then for $x \in R, ax^2 + bx + c$ and a have the same sign .

A. Both A are R are ture R is the correct explanation Of A

B. Both A are R are true but R is not correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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4. A : $x^2 + x - 12 \leq 0 \Rightarrow x \in [-4, 3]$

R : if α, β are the roots of $ax^2 + bx + c = 0$, $\alpha < \beta$ then $\alpha < x < \beta \Leftrightarrow ax^2 + bx + c$ and a have opposite signs .

A. Both A are R are ture R is the correct explanation Of A

B. Both A are R are true but R is not correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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