DPP-1(Roots of Quadratic Equation)

Subjective :

1. If α and β are the roots of $ax^2 + bx + c = 0$, find the value of $(a\alpha + b)^{-2} + (a\beta + b)^{-2}$.

2. If the coefficient of the quadratic equation are rational & the coefficient of x^2 is 1 , then find the equation one of whose roots is $\tan \frac{\pi}{8}$.

3. If equation $\frac{x^2-bx}{ax-c} = \frac{k-1}{k+1}$ has roots equal in magnitude & opposite in sign, then find the value of k

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

5. If the equation $(\lambda^2 - 5\lambda + 6)x^2 + (\lambda^2 - 3\lambda + 2)x + (\lambda^2 - 4) = 0$ has more than two roots, then find the value of λ ?

6. If the roots of the equation $(x - a)(x - b) - k = 0$ be c and d, then prove that the roots of the equation $(x - c)(x - d) + k = 0$, are a and b.

Single correct answer type :

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

(A) $a + b + c$ & $a - b + c$ (B) $1/2$ & $a - 2b + c$

(C) $a - 2b + c$ & $1/(a + b - 2c)$ (D) none of these

8. For the equation $3x^2 + px + 3 = 0, p > 0$ if one of the roots is square of the other, then p is equal to:

(A) $1/3$ (B) 1 (C) 3 (D) $2/3$

9. If α, β are the roots of quadratic equation $x^2 + px + q = 0$ and γ, δ are the roots of $x^2 + px - r = 0$, then $(\alpha - \gamma) \cdot (\alpha - \delta)$ is equal to :

(A) $q + r$ (B) $q - r$ (C) $-(q + r)$ (D) $-(p + q + r)$

10. If $\sin\alpha$ & $\cos\alpha$ are the roots of the equation $ax^2 + bx + c = 0$ then -

(A) $a^2 - b^2 + 2ac = 0$ (B) $a^2 + b^2 + 2ac = 0$

(C) $a^2 - b^2 - 2ac = 0$ (D) $a^2 + b^2 - 2ac = 0$

11. If α, β are the roots of the equation $x^2 - 3x + 1 = 0$, then the equation with roots $\frac{1}{\alpha-2}, \frac{1}{\beta-2}$ will be

(A) $x^2 - x - 1 = 0$ (B) $x^2 + x - 1 = 0$

(C) $x^2 + x + 2 = 0$ (D) none of these

12. Let α, β, γ be the roots of $(x - a)(x - b)(x - c) = d, d \neq 0$, then the roots of the equation $(x - \alpha)(x - \beta)(x - \gamma) + d = 0$ are :

(A) $a + 1, b + 1, c + 1$ (B) a, b, c

(C) $a - 1, b - 1, c - 1$ (D) $\frac{a}{b}, \frac{b}{c}, \frac{c}{a}$

13. Let two numbers have arithmetic mean 9 and 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) $x^2 - 18x - 16 = 0$

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

(A) $0, -1$ (B) - 1, 1 (C) 0,1 (D) $-1,2$

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

(A) 3 (B) 12 (C) $49/4$ (D) 4

16. 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) 2 (B) 3 (C) 0 (D) 1

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

(A) 1 (B) 2 (C) 3 (D) -2

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

(A) 0 (B) 1 (C) 2 (D) 3

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

(A) $(-3, \infty)$ (B) $(3, \infty)$ (C) $(-\infty, -3)$ (D) $(-3,3)$

20. If α and β are the roots of the equation $x^2 - x + 1 = 0$, then $\alpha^{2009} + \beta^{2009} =$

(A) -2 (B) -1 (C) 1 (D) 2

21. 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 $\frac{a_{10} - 2a_8}{2a_9}$ is equal to :

(A) 3 (B) -3 (C) 6 (D) -6

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

(A) -4 (B) 6 (C) 5 (D) 3

More than one answer type :

23. If α is a root of the equation $2x(2x+1)=1$, then the other root is –

(A) $3\alpha^3-4\alpha$ (B) $-2\alpha(\alpha+1)$ (C) $4\alpha^3-3\alpha$ (D) none of these

24. If a, b are non-zero real numbers and α, β the roots of $x^2+ax+b=0$, then

(A) α^2, β^2 are the roots of $x^2-(2b-a^2)x+a^2=0$

(B) $\frac{1}{\alpha}, \frac{1}{\beta}$ are the roots of $bx^2+ax+1=0$

(C) $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$ are the roots of $bx^2+(2b-a^2)x+b=0$

(D) $(\alpha-1), (\beta-1)$ are the roots of the equation $x^2+x(a+2)+1+a+b=0$

Answer Key

1.	$\frac{b^2-2ac}{a^2c^2}$	**2.**	x^2+2x-1	**3.**	$k=\frac{a-b}{a+b}$	**4.**	$-10,-3$	**5.**	$\lambda=2$	**7.**	D		
8.	C	**9.**	C	**10.**	A	**11.**	A	**12.**	B	**13.**	B	**14.**	A
15.	C	**16.**	D	**17.**	A	**18.**	D	**19.**	D	**20.**	C	**21.**	A
22.	D	**23.**	BC	24.	BCD								