A Premier Institute for Pre-Medical & Pre Engineering

SRI VIDYA ARADHANA ACADEMY

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P C M B
PHYSICS CHEMISTRY MATHEMATICS BIOLOGY

NEET/JEE

Topic: Quadratic Equation

Sub: Mathematics   **DPP: 01**   Prof. Chetan Sir

1. Find the roots of following equations :
   (a) $x^2 + 3x + 2 = 0$ (b) $x^2 - 8x + 16 = 0$ (c) $x^2 - 2x - 1 = 0$

2. Find the roots of the equation $a(x^2 + 1) - (a^2 + 1)x = 0$, where $a \neq 0$.

3. Solve : $\dfrac{6 - x}{x^2 - 4} = 2 + \dfrac{x}{x + 2}$

4. Solve for x: $\dfrac{x + 3}{x - 2} - \dfrac{1 - x}{x} = \dfrac{17}{4}$

5. If the roots of $4x^2 + 5k = (5k + 1)x$ differ by unity, then find the values of k.

6. For what values of a is the sum of the roots of the equation $x^2 + (2 - a - a^2)x - a^2 = 0$ equal to zero ?

7. For what values of a is the ratio of the roots of the equation $ax^2 - (a + 3)x + 3 = 0$ equal to 1.5?

8. The roots x_1 and x_2 of the equation $x^2 + px + 12 = 0$ are such that $x_2 - x_1 = 1$. Find p.

9. Find k in the equation $5x^2 - kx + 1 = 0$ such that the difference between the roots of the equation is unity.

10. Find p in the equation $x^2 - 4x + p = 0$ if it is know that the sum of the squares of its roots is equal to 16.

11. For what values of a is the difference between the roots of the equation $2x^2 - (a + 1)x + (a - 1) = 0$ equal to their product ?

12. Express $x_1^3 + x_2^3$ in terms of the coefficients of the equation $x^2 + px + q = 0$, where x_1 and x_2 are the roots of the equation.

13. Assume that x_1 and x_2 are roots of the equation $3x^2 - ax + 2a - 1 = 0$. Calculate $x_1^3 + x_2^3$.

14. Without solving the equation $3x^2 - 5x - 2 = 0$, find the sum of the cubes of its roots.

15. Solve the equation $(x^2 + x)^2 - 8(x^2 + x) + 12 = 0$.

16. Solve the equation $4^x - 3 \cdot 2^{x+3} + 128 = 0$.

17. Solve for x: $\left(\dfrac{x}{x + 1}\right)^2 - 5\left(\dfrac{x}{x + 1}\right) + 6 = 0$.

18. Solve for x: $x - 5\sqrt{x} + 4 = 0$.

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

20. If the sum of the roots of the equation $kx^2 + 2x + 3k = 0$ is equal to their product, find the value of k.

21. If α and β are the roots of $x^2 - 5x + 3 = 0$, find the value of $\alpha^2\beta + \alpha\beta^2$.

22. If α and β are the roots of the equation $x^2 - 5x + 2 = 0$, find the value of the following expressions:

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

    (b) $\alpha^3 + \beta^3$

    (c) $\dfrac{1}{\alpha} + \dfrac{1}{\beta}$

    (d) $\dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

23. If α and β are the roots of the equation $x^2 - 2\sqrt{3}x + 2 = 0$, find the value of $\alpha^4 + \beta^4$.

24. If α and β are the roots of the equation $2x^2 - 3x - 1 = 0$, find the value of $\alpha^6 + \beta^6$.

25. Find the value(s) of k for which one root of the equation $8x^2 - 30x + k = 0$ is the square of the other.

26. Find the value(s) of m for which one root of the equation $x^2 + (5 - m)x + 2 = 0$ is half of the other.

Answer Key (DPP - 1)

1	(a) -1, -2; (b) 4; (c) $1 \pm \sqrt{2}$	**2**	$a, \frac{1}{a}$	**3**	$\frac{7}{3}$	**4**	$x = 4, -2/9$
5	$3, -\frac{1}{5}$	**6**	$a_1 = -2, a_2 = 1$	**7**	$a_1 = 2, a_2 = 9/2$	**8**	$p = \pm 7$
9	$k = \pm 3\sqrt{5}$	**10**	$p = 0$	**11**	$a = 2$	**12**	$3pq - p^3$
13	$\frac{a(a^2 - 18a + 9)}{27}$	**14**	$\frac{215}{27}$	**15**	$x \in \{-3, -2, 1, 2\}$	**16**	$x = 3, 4$
17	$x = -2, -3/2$	**18**	$x = 1, 16$	**19**	$k = 5$	**20**	$k = -2/3$
21	15	**22**	(a) 21; (b) 95; (c) 5/2; (d) 21/2	**23**	56	**24**	$\frac{2041}{64}$
25	$k = 27$ or $k = -125$	**26**	$m = 2$ or $m = 8$	**27**		**28**	