

Date Planned : __ / __ / __	Daily Tutorial Sheet - 4	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 1	Exact Duration : _____

46. If the roots of the quadratic equation $x^2 - 4x - \log_3 a = 0$ are real, the least value of a is: 
- (A) 81 (B) 1/81 (C) 1/64 (D) None of these
47. The quadratic equation whose roots are reciprocal of the roots of the equation $ax^2 + bx + c = 0$ is: 
- (A) $cx^2 + bx + a = 0$ (B) $bx^2 + cx + a = 0$
(C) $cx^2 + ax + b = 0$ (D) $bx^2 + ax + c = 0$
48. If the roots of the equation $\frac{1}{x+a} + \frac{1}{x+b} = \frac{1}{c}$ are equal in magnitude but opposite in sign, then their product is: 
- (A) $\frac{1}{2}(a^2 + b^2)$ (B) $-\frac{1}{2}(a^2 + b^2)$ (C) $\frac{1}{2}ab$ (D) $-\frac{1}{2}ab$
49. If one root of the equation $8x^2 - 6x - a - 3 = 0$ is the square of the other, then the values of a are:
- (A) 4, -24 (B) 4, 24 (C) -4, -24 (D) -4, 24
50. If x is an integer satisfying $x^2 - 6x + 5 \leq 0$ and $x^2 - 2x > 0$ then the number of possible values of x is:
- (A) 3 (B) 4 (C) 2 (D) Infinite
51. If, α, β are the roots of $ax^2 + bx + c = 0$, then $\frac{\alpha^3 + \beta^3}{\alpha^{-3} + \beta^{-3}}$ is equal to:
- (A) $\frac{c^2}{a^2}$ (B) $\frac{c^3}{a^3}$ (C) $\frac{3abc - b^3}{c^3}$ (D) $\frac{b^2 - 2ac}{ac}$
52. If, α, β are the roots of $ax^2 + bx + c = 0$, then $\left(\frac{1}{\alpha^2} - \frac{1}{\beta^2}\right)^2$ is equal to:
- (A) $\frac{b^2(b^2 - 4ac)}{c^2a^2}$ (B) $\frac{b^2(b^2 - 4ac)}{ca^3}$ (C) $\frac{b^2(b^2 - 4ac)}{a^4}$ (D) $\frac{b^2(b^2 - 4ac)}{c^4}$
53. If α, β are the roots of the equation $ax^2 + bx + c = 0$, then the quadratic equation whose roots $\alpha + \beta, \alpha\beta$ 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) $ax^2 - (b + c)x + bc = 0$
54. The condition that the roots of $ax^2 + bx + c = 0$ may be in the ratio $m : n$ is:
- (A) $mnb^2 = ac(m + n)^2$ (B) $mnb = ac(m + n)^2$
(C) $mna^2 = bc(m + n)^2$ (D) $mnc^2 = ab(m + n)^2$

- 55.** The greatest value of the expression $\frac{1}{4x^2 + 2x + 1}$ is:
- (A) $\frac{4}{3}$ (B) $\frac{5}{2}$ (C) $\frac{13}{14}$ (D) None of these
- 56.** If $x \in R$, then $f(x) = (x-1)^2 + (x-2)^2 + (x-3)^2 + (x-4)^2$ assumes its minimum value at: ▶
- (A) $x = 10$ (B) $x = 2.5$ (C) $x = 20$ (D) None of these
- 57.** The values of x satisfying $\left| \frac{x^2 - 1}{x^2 + x + 1} \right| < 1$, are: ▶
- (A) $x \in (-2, \infty)$ (B) $x \in \left(-\infty, -\frac{1}{2} \right) \cup (0, \infty)$
- (C) $x \in \left(-2, -\frac{1}{2} \right) \cup (0, \infty)$ (D) None of these
- 58.** The number of roots of the equation $|x| = x^2 + x - 4$ is :
- (A) 4 (B) 3 (C) 1 (D) 2
- 59.** The values of x satisfying $|x^2 + 4x + 3| + (2x + 5) = 0$ are: ▶
- (A) $-4, -1 - \sqrt{3}$ (B) $4, 1 + \sqrt{3}$ (C) $-4, 1 - \sqrt{3}$ (D) $-4, 1 + \sqrt{3}$
- 60.** The sum of roots of the equation $|2x + 3| - |x - 1| = 6$ is :
- (A) -12 (B) 12 (C) 8 (D) -8