

Quadratic Equations & Inequations

Date Planned : __ / __ / __	Daily Tutorial Sheet - 6	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 2	Exact Duration : _____

76. If, α, β are the roots of $ax^2 + 2bx + c = 0$ and $\alpha + \delta, \beta + \delta$ are the roots of $Ax^2 + 2Bx + C = 0$, then $\frac{b^2 - ac}{B^2 - AC}$ is equal to: 
- (A) a/A (B) A/a (C) $\left(\frac{a}{A}\right)^2$ (D) $\left(\frac{A}{a}\right)^2$
77. If the equations $k(6x^2 + 3) + rx + 2x^2 - 1 = 0$ and $6k(2x^2 + 1) + px + 4x^2 - 2 = 0$ have both roots common, then the value of $(2r - p)$ is: 
- (A) 0 (B) $\frac{1}{2}$ (C) 1 (D) None of these
78. If the quadratic equations $3x^2 + ax + 1 = 0$ and $2x^2 + bx + 1 = 0$ have a common root, then the value of the expression $5ab - 2a^2 - 3b^2$ is: 
- (A) 0 (B) 1 (C) -1 (D) None of these
79. If a, b, p, q are non-zero real numbers, then two equations $2a^2x^2 - 2abx + b^2 = 0$ and $p^2x^2 + 2pqx + q^2 = 0$ have: 
- (A) no common root (B) one common root if $2a^2 + b^2 = p^2 + q^2$
(C) two common roots if $3pq = 2ab$ (D) two common roots if $3qb = 2ap$
80. The value of parameter a for which $\frac{ax^2 + 3x - 4}{a + 3x - 4x^2}$ takes all real values for $x \in R$ are : 
- (A) $a \in \left(-\frac{9}{16}, 7\right)$ (B) $a \in \left(-\frac{9}{16}, 1\right)$ (C) $a \in [1, 7]$ (D) None of these
81. If for all real x , for which $\frac{x+a}{x^2+bx+c^2}$ is defined, it attains all real values: 
- (A) $b^2 > 4c^2$ and $a^2 + c^2 \geq ab$ (B) $b^2 > 4c^2$ and $a^2 + c^2 \leq ab$
(C) $b^2 < 4c^2$ and $a^2 + c^2 \geq ab$ (D) $b^2 < 4c^2$ and $a^2 + c^2 \leq ab$

- 82.** If $f(x) = \frac{ax^2 + x - 2}{a + x - 2x^2}$ has the range R when $x \in R$, then: 
- (A) $a \in \left(-\frac{1}{8}, 1\right)$ (B) $a \in \left(-\frac{1}{8}, 3\right)$ (C) $a \in [1, 3]$ (D) None of these
- 83.** Let $f(x) = \frac{mx^2 + 3x + 4}{x^2 + 3x + 4}$, $m \in R$. If $f(x) < 5$ for all $x \in R$ then the possible set of values of m is: 
- (A) $m < \frac{11}{4}$ (B) $m < 5$ (C) $\frac{11}{4} < m < 5$ (D) None of these
- *84.** Which of the following functions of x has range R : 
- (A) $\frac{(x-1)(x-2)}{x-3}$ (B) $\frac{x-3}{(x-1)(x-2)}$ (C) $\frac{(x-1)(x-3)}{x-2}$ (D) $\frac{x-2}{(x-1)(x-3)}$
- 85.** If a and b ($\neq 0$) are the roots of the equation $x^2 + ax + b = 0$, then the least value of $x^2 + ax + b$ ($x \in R$) is:
- (A) $\frac{9}{4}$ (B) $-\frac{9}{4}$ (C) $-\frac{1}{4}$ (D) $\frac{1}{4}$