

Date Planned : __ / __ / __	Daily Tutorial Sheet - 9	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 2	Exact Duration : _____

- 106.** Let α, β be the roots of $ax^2 + bx + c = 0$; γ, δ be the roots of $px^2 + qx + r = 0$; D_1 and D_2 be the respective discriminants of these equations. If α, β, γ and δ are in AP, then $D_1 : D_2$ is :
- (A) $\frac{a^2}{b^2}$ (B) $\frac{a^2}{p^2}$ (C) $\frac{b^2}{q^2}$ (D) $\frac{c^2}{r^2}$
- 107.** If $b_1b_2 = 2(c_1 + c_2)$, then at least one of the equations $x^2 + b_1x + c_1 = 0$ and $x^2 + b_2x + c_2 = 0$ has :
- (A) Real roots (B) Purely imaginary roots
(C) Imaginary roots (D) None of these
- 108.** If α, β are roots of $ax^2 + bx + c = 0$, then the equation $ax^2 - bx(x-1) + c(x-1)^2 = 0$ has roots: 
- (A) $\frac{\alpha}{1-\alpha}, \frac{\beta}{1-\beta}$ (B) $\frac{1-\alpha}{\alpha}, \frac{\beta}{1-\beta}$ (C) $\frac{\alpha}{1+\alpha}, \frac{\beta}{1+\beta}$ (D) $\frac{\alpha+1}{\alpha}, \frac{\beta+1}{\beta}$
- 109.** If $a > 1$, roots of the equation $(1-a)x^2 + 3ax - 1 = 0$ are :
- (A) One positive and one negative (B) Both negative
(C) Both positive (D) Both nonreal complex
- 110.** The polynomial $(ax^2 + bx + c)(ax^2 - dx - c), ac \neq 0$, has :
- (A) Four-real zeros (B) At least two-real zeros
(C) At most two-real zeros (D) No real zeros
- 111.** If the equation $ax^2 + 2bx - 3c = 0$ has non-real roots and $(3c/4) < (a+b)$, then c is always :
- (A) < 0 (B) 0 (C) ≥ 0 (D) Zero
- 112.** If $a(p+q)^2 + 2bpq + c = 0$ and $a(p+r)^2 + 2bpr + c = 0, (a \neq 0)$ then : 
- (A) $qr = p^2 + \frac{c}{a}$ (B) $qr = p^2$ (C) $qr = -p^2$ (D) None of these
- 113.** If α and $\beta (\alpha < \beta)$ are the roots of the equation $x^2 + bx + c = 0$, where $c < 0 < b$, then :
- (A) $0 < \alpha < \beta$ (B) $\alpha < 0 < \beta < |\alpha|$ (C) $\alpha < \beta < 0$ (D) $\alpha < 0 < |\alpha| < \beta$
- 114.** The number of real solutions of the equation $\left(\frac{9}{10}\right)^x = -3 + x - x^2$ 
- (A) Zero (B) Three (C) Two (D) More than two
- 115.** If the roots of $a_1x^2 + b_1x + c_1 = 0$ are α_1, β_1 and those of $a_2x^2 + b_2x + c_2 = 0$ are α_2, β_2 such that $\alpha_1\alpha_2 = \beta_1\beta_2 = 1$ then : 
- (A) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (B) $\frac{a_1}{c_2} = \frac{b_1}{b_2} = \frac{c_1}{a_2}$ (C) $a_1a_2 = b_1b_2 = c_1c_2$ (D) None of these