

(MATHEMATICS)

FUNCTIONS

DPP - 1

- The angles α and β are such that $\tan \alpha = m + 2$ and $\tan \beta = m$ where m is a constant. If $\sec^2 \alpha - \sec^2 \beta = 16$ then the value of $\cot (\alpha - \beta)$ is equal to
(A) 2 (B) 4 (C) 6 (D) 8
- The equation $|x|^2 + |x| - 6 = 0$ has
(A) only one root (B) four roots
(C) the sum of the roots is zero. (D) the product of the roots is -6 .
- If $(n + 3)^2 = a(n + 2)^2 + b(n + 1)^2 + c^2$ holds true for every positive integer n then the quadratic equation $ax^2 + bx + c = 0$ has
(A) both positive roots (B) both negative roots
(C) one positive and one negative root (D) no real roots.
- The real number x and y satisfy the equation $xy = \sin (2t)$ and $\frac{x}{y} = \tan (t)$ where $0 < t < \frac{\pi}{2}$. The value of $x^2 + y^2$, is
(A) $\sqrt{2}$ (B) 1 (C) 2 (D) 4
- How many distinct real numbers belongs to the following collection
 $\left\{ \ln(4 - \sqrt{15}); \ln(4 + \sqrt{15}); -\ln(4 - \sqrt{15}); -\ln(4 + \sqrt{15}); \ln \left(\frac{4 + \sqrt{15}}{4 - \sqrt{15}} \right); \ln(31 + 8\sqrt{15}) \right\}$
(A) 2 (B) 3 (C) 4 (D) 5
- In the range $0 \leq x < 2\pi$, the equation $\cos (\sin x) = \frac{1}{2}$ has
(A) no solution (B) one solution
(C) two solutions (D) three solutions
- Suppose that 'a' and 'b' are two roots of the equation $x^2 + 3x + 5 = 0$. If $t = \frac{a+2}{b+2}$ and $s = \frac{b+2}{a+2}$ are the two roots of $x^2 - mx + 1 = 0$ then the value of 'm' is
(A) $-5/2$ (B) $-5/3$ (C) $5/2$ (D) $5/3$
- The value of 'a' for which $\frac{\log_a 7}{\log_6 7} = \log_{\pi} 36$ holds good, is
(A) $1/\pi$ (B) π^2 (C) $\sqrt{\pi}$ (D) 2
- The product $\tan (\ln x) \cdot \tan \left(\ln \frac{x}{2} \right) \cdot \tan (\ln 2)$ wherever defined, is also equal to
(A) $\tan (\ln x) + \tan \left(\ln \frac{x}{2} \right) + \tan (\ln 2)$ (B) $\tan (\ln x) + \tan \left(\ln \frac{x}{2} \right) - \tan (\ln 2)$
(C) $\tan (\ln x) - \tan \left(\ln \frac{x}{2} \right) + \tan (\ln 2)$ (D) $\tan (\ln x) - \tan \left(\ln \frac{x}{2} \right) - \tan (\ln 2)$

Answer Key

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|----|---|----|---|----|---|----|---|----|---|----|---|
| 1. | D | 2. | C | 3. | D | 4. | C | 5. | B | 6. | A |
| 7. | B | 8. | C | 9. | D | | | | | | |