

- The number of solutions of the equation $\log_4(x-1) = \log_2(x-3)$ is _____.
 - The number of distinct solutions of the equation, $\log_{\frac{1}{2}}|\sin x| = 2 - \log_{\frac{1}{2}}|\cos x|$ in the interval $[0, 2\pi]$, is _____.
 - Let a, b, c be the three distinct positive real numbers such that $(2a)^{\log_e a} = (bc)^{\log_e b}$ and $b^{\log_e 2} = a^{\log_e c}$. Then $6a + 5bc$ is equal to _____.
(Ignore the case where we are getting infinite solutions for a, b, c)
- NOTE: This question was BONUS in JEE Mains, We have modified the question statement
- If the solution of the equation $\log_{\cos x}(\cot x) + 4\log_{\sin x}(\tan x) = 1$, $x \in \left(0, \frac{\pi}{2}\right)$ is $\sin^{-1}\left(\frac{\alpha + \sqrt{\beta}}{2}\right)$, where α, β are integers, then $\alpha + \beta$ is equal to:
 (1) 3 (2) 5
 (3) 6 (4) 4
 - The sum of the roots of the equation, $x + 1 - 2\log_2(3 + 2^x) + 2\log_4(10 - 2^{-x}) = 0$, is :
 (1) $\log_2 14$ (2) $\log_2 12$
 (3) $\log_2 13$ (4) $\log_2 11$
 - The number of solutions of the equation $\log_{(x+1)}(2x^2 + 7x + 5) + \log_{(2x+5)}(x+1)^2 - 4 = 0$, $x > 0$, is _____.
 - If for $x \in \left(0, \frac{\pi}{2}\right)$, $\log_{10} \sin x + \log_{10} \cos x = -1$ and $\log_{10}(\sin x + \cos x) = \frac{1}{2}(\log_{10} n - 1)$, $n > 0$, then the value of n is equal to :
 (1) 20 (2) 12
 (3) 9 (4) 16
 - Let $A = \{x \in R : |x+1| < 2\}$ and $B = \{x \in R : |x-1| \geq 2\}$. Then which one the following statements is NOT true?
 (1) $A - B = (-1, 1)$ (2) $B - A = R - (-3, 1)$
 (3) $A \cap B = (-3, -1]$ (4) $A \cup B = R - [1, 3)$
 - If $A = \{x \in R : |x| < 2\}$ and $B = \{x \in R : |x-2| \geq 3\}$; then
 (1) $A \cap B = (-2, -1)$ (2) $B - A = R - (-2, 5)$
 (3) $A \cup B = R - (2, 5)$ (4) $A - B = [-1, 2)$
 - The number of integral solution x of $\log_{\left(x+\frac{7}{2}\right)}\left(\frac{x-7}{2x-3}\right)^2 \geq 0$ is
 (1) 7 (2) 8
 (3) 6 (4) 5
 - Let $S = \{x \in [-6, 3] - \{-2, 2\} : \frac{|x+3|-1}{|x|-2} \geq 0\}$ and $T = \{x \in Z : x^2 - 7|x| + 9 \leq 0\}$. Then the number of elements in $S \cap T$ is
 (1) 7 (2) 5
 (3) 4 (4) 3
 - If $A = \{x \in R : |x-2| > 1\}$, $B = \{x \in R : \sqrt{x^2-3} > 1\}$, $C = \{x \in R : |x-4| \geq 2\}$ and Z is the set of all integers, then the number of subsets of the set $(A \cap B \cap C)^c \cap Z$ is _____.