MATHS

BOOKS - CENGAGE MATHS (HINGLISH)

Quadratic Equations, Inequalities, Modulus and Logarithms

Question Bank

1. Let a, b, c, d are positive integers such that $\log_a b = \frac{3}{2}$ and $\log_e d = \frac{5}{4}$. If (a-c)=9, find the

value of (b-d)

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2. Find the largest natural number ' a ' for which the maximum value of $f(x) = a - 1 + 2x - x^2$ is smaller than the minimum value of $g(x) = x^2 - 2ax + 10 - 2a$.

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3. If a positive real number x satisfy the condition $x^5 - x^3 + x = 1$ then the minimum value of x^6 is equal to

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4. 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

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5. The value of the expression $x^4 - 8x^3 + 18x^2 - 8x + 2$ when $x = \frac{\cot(\pi)}{12}$ is

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6. If λ_1 and λ_2 be two values of λ for which the expression $x^2 + (2 - \lambda)x + \lambda - \frac{3}{4}$ becomes a perfect square, then calculate the value of $(\lambda_1^2 + \lambda_2^2)$.

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7. If k be an integer and p is a prime such that the quadratic equation $x^2 + kx + p = 0$ has two distinct positive integer solutions find the value of $-(k + p)$.

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8. If the equation $x^3 + kx^2 + 3 = 0$ and $x^2 + kx + 3 = 0$ have a common root, then the absolute of k.

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9. Number of possible integral values of m in $(-10, 10]$ for which the quadratic equation $x^2 \div (m+6)|x| + 2m + 8 = 0$ has two distinct solutions.

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10. The greatest integral value of k for which the equation $(2-x)(x+1) = k$ has non-négative roots, is If $ax^2 + bx + c = 0$ and $bx^2 + cx + a = 0, a, b, c \neq 0$ have a common root, then value $\left(\frac{a^3+b^3+c^3}{abc}\right)^2$ is

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11. If $ax^2 + bx + c = 0$ and $bx^2 + cx + a = 0, a, b, c \neq 0$ have a common root, then value of $\left(\frac{a^3 + b^3 + c^3}{abc}\right)^2$ is

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12. Let α and β are the roots of $x^2 - 10x + 2k^2 + 2k = 0$ and α, γ are the roots of $x^2 - (3k + 2)x + k^3 + 3 = 0$ (where

$k \in I$). If α, γ and β are in A.P., then the value of $\alpha + \beta^2 + \gamma^3$ is

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13. Let r_1, r_2 and r_3 be the solutions of the equation $x^3 - 2x^2 + 4x + 5074 = 0$, then the yalue of absolute value of $(r_1 \div 2)(r_2 + 2)(r_3 + 2)$

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14. If $f(x) = \dfrac{(x+3)^{201}(x-1)^{102}(x-5)^{305}}{x^5(3x+4)^{503}}$, then sum of integral values of x for which $f(x) \leq 0$.

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15. The equation $\alpha x^3 - 2(\alpha+1)x^2 + 4\alpha x = 0$ has real roots and α is any positive integer, then the sum of the roots of the equation is

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16. If $f(x) = ax^2 + bx + c, a, b, c \in I$ and `f(1)=0,50 lt f(7) lt 60 and 70 lt f(8) lt 80 then f(-1) (is equal to)

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17. If $\log_a\left(ax^2 + 5x + c\right) \leq 0 \forall x \in R$ and $\log_a 5 + \log_5 a \leq -2$ then minimum integral value of 4 a c is

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18. If α, β be the roots of $x^2 + x + 2 = 0$ and γ, δ be the roots of $x^2 + 3x + 4 = 0$, then $(\alpha + \gamma)(\alpha + \delta)(\beta + \gamma)(\beta + \delta)$ is equal to

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19. The number of integral value(s) of a so that the graph of $y = 16x^2 + 8(a + 5)x - 7a - 5$ is always above the x -axis is

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20. Number of integral values of a such that the quadratic equation $x^2 + ax + a + 1 = 0$ has integral roots is

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21. If $P(x) = x^2 + ax + 1$. If $P(x)$ is a negative integer for only one real x, then number of values of a is

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22. If

$$A = \frac{(\log_2 3)^3 - (\log_2 6)^3 - (\log_2 12)^3 + (\log_2 24)^3}{6}$$

then the value of (2^(A)) is equal to

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23. If a, b and c be the roots of $3x^3 + 8x + 7 = 0$, then the value of $(a+b)^3 + (b+c)^3 + (c+a)^3$ is equal to

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24. If α, β, γ are roots of equation $x^3 - 2x^2 - 1 = 0$ and $T_n = \alpha^n + \beta^n + \gamma^n$, then value of $\frac{T_{11} - T_8}{T_{10}}$ is

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25. The minimum value of the expression $x^2 - kx + \alpha$ is 6 which is obtained at $x = 3$. Find the value of $\frac{\alpha}{3}$.

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26. If α, β are the roots of the equation $x^2 - 3x - 15 = 0$, and $f(n) = \alpha^n + \beta^n$, then $\dfrac{f(8) - 3f(7) + f(6)}{2f(6)}$ is equal to

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27. If $a, b, c, d \in Q$ (Rational number), such that two roots of the equation $x^4 + ax^3 + bx^2 + cx + d = 0$ are $\sqrt{3} \pm 2$, then $|a| + |b| + |c| + |d|$ is equal to

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28. If $x + y + z = 5$ and $xy + yz + zx = 3$, then the greatest value of $(-x)$ is

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29. Number of values of x satisfying the pair of quadratic equations $x^2 - px + 20 = 0$ and $x^2 - 20x + p = 0$ for some $p \in R$, is

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30. If $\left(y^2-5x\right)\left(x^2+2x+4\right)<2$, for all $x \in R$, then number of integers in the range of y is

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31. Number of integral value(s) of ' x ' satisfying the equation

$|2x+1|+|5-2x|=6$, is

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