

QUESTION # 1

Find the exact value of the expression: $\log_{64} (8 + 8 + 8 + 8)$

QUESTION # 2

If y varies directly as the square of x and inversely as z , and $y = 6$ while x and z equal 2 and 3 respectively, find z when $y = 12$ and $x = 6$

QUESTION # 3

Express: $\frac{|z|}{z^2 - 1}$ in the form $a + bi$, where $z = 4 + 3i$

QUESTION # 15

Find x if: $(32x)^2 = 868x$

QUESTION # 5

If N is the square of a positive integer, and the next three consecutive integral squares are A , B , and C in order. Find $C - B$ in terms of N .

QUESTION # 6

Given: $xy = 13$ and $x^2y + xy^2 - x - y = 24$

Find: $x^2 + y^2$

QUESTION # 7

Find SP if S is the sum of the roots and P is the product of the roots of:

$$\frac{k^3}{2} - \frac{k^2}{3} = \frac{(9 - k)}{3}$$

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QUESTION # 8

Find the value of k if $x + 1$ is a factor of $x^2 + kx^3 - 2x + 1$

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QUESTION # 9

When x is added to the numerator and subtracted from the denominator of the fraction $\frac{A}{B}$, $A \neq B$, $B \neq 0$, the value of the fraction is changed to $\frac{B}{A}$, $A \neq 0$. What does x equal?

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QUESTION # 10

Find: $(AB)^{2/3}$

Given: $A = (\log_4 9)(\log_3 2)(\log_4 5)(\log_5 6)(\log_6 49)(\log_7 8)$

$$B = \frac{n! 9!}{(n-2)! n} \cdot \frac{[(n+1)!]^2}{(n-1)!(n+2)! 8!} \cdot \frac{n+2}{n(n+1)(n-1)}$$

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QUESTION # 11

Tom, Dick, and Harry working together can do a certain job in 1 hr and 20 min. Tom working alone can do the same job in 3 hrs, while Dick can do it in 4 hrs. How long would it take Harry to do it alone?

QUESTION # 12Solve for x over the set of real numbers:

$$\frac{\sqrt{x} + 6}{\sqrt{x}} = \frac{2\sqrt{x} + 6}{\sqrt{x} + 1}, \quad x > 0$$

QUESTION # 13If $a * b = a^3 - 3a^2b + 3ab^2 - b^3$, find $(\log 20) * (\log 1/5)$ QUESTION # 14

Find the sum of the coefficients of the expansion of:

$$[(2x + 3y)^2(2x - 3y)^2]^2$$

QUESTION # 4Given: $f(x) = \log x$, $g(x) = |x|$, and $h(x) = x^2$ Find: all x such that $f[g(h(x))] = h[g(f(x))]$