4.5: (Exponential and Logarithmic Equations)

The solution set of the equation $9^x - 2(3)^{x+1} = 27$ consists of A) one positive real number only B) two negative real numbers C) one negative real number only D) one positive and one negative real number E) two positive real numbers	Exponential Equations.
The sum of all the solution(s) of the equation $2(4^{1-x}) - 3(2^{1-x}) = -1$ is A) $\log_2 6$ B) 3 C) -3 D) 1 E) $\log_2 3$	Exponential Equations.
The sum of all solutions of the equation $(8)^x = (\sqrt{2})^{2x+4}$ is A) -1 B) 3 C) -2 D) 1 E) 2	Exponential Equations.
If $(\sqrt[4]{3})^{8x+12} = (e)^{3x\ln 3}$, then $x =$ A) 3 B) 4 C) - 2 D) $\frac{3}{2}$ E) $\frac{5}{2}$	Exponential Equations.

If $\frac{8^x+8^{-x}}{8^x-8^{-x}}=3$, then $x=$ A) $\frac{1}{6}$ B) $\ln 6$ C) $\ln 2$ D) 1 E) – 1	Exponential Equations.
If the solution of the equation $2^{3x-2}=5^{x+1}$ is $x=\frac{\ln a+\ln b}{\ln c-\ln b}$, then $a+b+c=$ A) 17 B) 13 C) 11 D) 15 E) 19	Exponential Equations.
The sum of solutions of the equation $2^x-(6)2^{(-x)}-1=0$ is A) -1 B) $\log_3(2)$ C) $\ln 3$ D) $\log_2(3)$ E) $\ln\sqrt{3}$	Exponential Equations.
The sum of all the solutions of the equation $2\cdot 3^x-21\cdot 3^{-x}+1=0$ is A) 1 B) 3 C) $-\frac{1}{2}$ D) $\frac{9}{2}$ E) $\frac{1}{2}$	Exponential Equations.

The sum of all solution(s) of the equation $e^x - 12e^{-x} - 1 = 0$, is A) $\ln 4$ B) $\ln 12$ C) $\ln 3$ D) $1 + \ln 2$ E) $-\ln 12$	Exponential Equations.
If $6^{x+1} = 4^{2x-1}$ then, $x =$ A) $\frac{\log 24}{\log(8/3)}$ B) $\frac{\log 24}{\log(3/8)}$ C) $\frac{\log(3/2)}{\log(8/3)}$ D) $\frac{\log 8}{\log(1/2)}$ E) $\frac{\log 8}{\log(3/8)}$	Exponential Equations.
If $\log 2 = t$, then solving the equation $2^{x+3} = 5^x$ in terms of t, we get $x =$ A) $\frac{3t}{1-2t}$ B) $\frac{2t}{1-3t}$ C) $\frac{1-3t}{2t}$ D) $\frac{3t}{1+2t}$ E) $\frac{1+2t}{3t}$	Exponential Equations.

If $5^x = (3)(4^{1-x})$, then $x =$ A) $\frac{\ln 12}{\ln 20}$ B) $\ln\left(\frac{3}{5}\right)$ C) $\frac{\ln 3}{\ln 5}$ D) $\frac{\ln 6}{\ln 10}$ E) $\frac{\ln 5}{\ln 3}$	Exponential Equations.
If the solution of the equation $2^{2x+1} = 7(2^x) + 4$ is $x = A$, then $2A - 1 =$ A) $\frac{1}{2}$ B) 3 C) $\frac{3}{2}$ D) 0 E) 4	Exponential Equations.
The solution set of the equation $4^x - 2^x - 12 = 0$ consists of A) one positive integer only. B) one positive integer and one negative integer. C) two positive integers. D) two negative integers. E) one negative integer only.	Exponential Equations.

The sum of all the solution(s) of the equation $4^x - 2^{x+3} + 12 = 0$ is A) $\log_2 12$ B) $\log_2 6$ C) 7 D) $\log_2 8$ E) 1	Exponential Equations.
If $2^{x+1} = 3^{2x-1}$, then $x =$ (A) $\log_{9/2} 6$ B) $\log_{9/2} 5$ C) $\log_{3/2} 6$ D) $\log 6$ E) $\log_6 5$	Exponential Equations.
The sum of solutions of the equation $2e^{2x} - 13e^x = 15$ is: A) $\ln \frac{15}{2}$ B) $\ln \frac{17}{2}$ C) $\ln \frac{13}{2}$ D) $\ln \frac{3}{10}$ E) $\ln \frac{7}{2}$	Exponential Equations.

If $6e^{x} - 15e^{-x} + 1 = 0$, then $e^{2x} =$ A) $\frac{25}{9}$ B) $\frac{1}{4}$ C) $\frac{9}{4}$ D) $\frac{25}{4}$ E) $\frac{9}{25}$	Exponential Equations.
The equation $9^{x} - 2(3^{x+1}) = 27$ A) has only one positive integer solution. B) has two real solutions. C) has only one negative integer solution. D) has two nonreal solutions. E) has no solution.	Exponential Equations.
The sum of all solutions of the equation $2e^{x} + 6e^{-x} = 7$ is A) $\ln 3$ B) $\ln 2$ C) $\ln \frac{2}{3}$ D) $\ln \frac{3}{2}$ E) $\ln \frac{7}{2}$	Exponential Equations.

If the line $y = \frac{26}{27}$ intersects the graph of $y = -3^{x-2} + 1$ at the point (x_1, y_1), then $x_1 + y_1 =$ A) $\frac{28}{27}$ B) $-\frac{5}{27}$ C) $-\frac{23}{27}$ D) $-\frac{7}{27}$ E) $-\frac{1}{27}$	Exponential Equations.
The solution set of $(\sqrt{2})^{12x-8} = 4\left(\frac{1}{2}\right)^{5x+7}$ A) contains exactly one negative rational number B) contains exactly one negative irrational number C) contains exactly one positive irrational number D) contains exactly one positive rational number E) is the empty set	Exponential Equations.
f $y = \mathrm{A} + \mathrm{B}(1 - e^{-cx})$, then $x =$ A) $-\frac{1}{c}\ln\left(\frac{\mathrm{B}-y+\mathrm{A}}{\mathrm{B}}\right)$ B) $-\frac{1}{c}\ln\left(\frac{\mathrm{B}+y+\mathrm{A}}{\mathrm{B}}\right)$ C) $-\frac{1}{c}\ln\left(\frac{\mathrm{B}-y-\mathrm{A}}{\mathrm{B}}\right)$ D) $-\frac{1}{c}\ln\left(\frac{\mathrm{B}-y+\mathrm{A}}{\mathrm{A}}\right)$ E) $-\frac{1}{c}\ln\left(\frac{\mathrm{B}+y-\mathrm{A}}{\mathrm{A}}\right)$	Exponential Equations.

If the solution of the equation $\frac{7^x+7^{-x}}{7^x-7^{-x}} = 2$ is $x = \log_b \sqrt{a}$ then $a \cdot b =$ A) 21 B) 34 C) 14 D) 9 E) 24	Exponential Equations.
The sum of all solution(s) of the equation $e^x - 12e^{-x} - 1 = 0$, is A) $\ln 4$ B) $\ln 12$ C) $\ln 3$ D) $1 + \ln 2$ E) $-\ln 12$	Exponential Equations.
The SUM of all solutions of the equation $125^{-3} = \left(\frac{1}{5}\right)^{\lvert x+2 \rvert}$ is A) - 4 B) 1 C) 5 D) - 5 E) 4	Exponential Equations.

If $x = a$ is the solution of the equation $125^x + 5^{3x+1} = 12$, then $3a =$ A) 3 B) $\log_5 2$ C) $\log_5 3$ D) 0 E) 2	Exponential Equations.
If $e^{k-1} = \left(\frac{1}{e^4}\right)^{k+1}$, then $k =$ A) $-3/5$ B) $1/5$ C) $1/2$ D) -2 E) $1/3$	Exponential Equations.
The sum of all the solution(s) of $2(3^{2x-6}) - 4 = 8$ is A) $3 + \log_3 \sqrt{6}$ B) $6 + \log_3 6$ C) $3 + \log_3 36$ D) $6 - \log_3 \sqrt{6}$ E) $6 - \log_3 \sqrt{3}$	Exponential Equations.

The sum of all the solution(s) of $e^{x} - 6e^{-x} = -1$ is A) $\ln 2$ B) $\ln 3$ C) $-\ln 6$ D) 1 E) 2	Exponential Equations.
The solution set of the equation $\log_3(x-2) = 1 + \log_{\frac{1}{3}}(x+2)$ consists of A) Two rational solutions. B) Two solutions one rational and one irrational. C) One irrational solution only. D) Two irrational solutions of different signs. E) Only one integer.	Logarithmic Equations.
The solution set of the equation $\ln(4x-2) - \ln e^{\ln 4} = -\ln(x-2)$ contains A) only one positive rational number B) only one negative rational number C) one negative and one positive rational numbers D) two positive rational numbers E) no real solution	Logarithmic Equations.

The equation $\ln e^{\ln x^2} - \ln(4 - x) = \ln 2$ has A) one negative and one positive real solution B) only one positive real solution C) only one negative real solution D) two negative real solutions E) no real solution	Logarithmic Equations.
The sum of all the solution(s) of the equation $\ln(2x^2 - 4x + 1) = 2\ln(1 - x)$ is A) 1 B) 2 C) -1 D) 0 E) -2	Logarithmic Equations.
The solution set of the equation $\sqrt{\log_2 x} = -\log_2 \sqrt{x}$ contains A) one positive integer only B) one positive and one negative integers C) no real numbers D) two positive integers E) one negative integer only	Logarithmic Equations.

If $y = \log(x+1) - \log x$, then $x =$ A) $\frac{1}{10^y-1}$ B) $\frac{1}{10^y+1}$ C) $10^y + 1$ D) $10^y - 1$ E) $\frac{1}{e^y-1}$	Logarithmic Equations.
The sum of all the solution(s) of $\log(x+2) = 1 + \log_{0.1}(x-1)$ is A) -1 B) 1 C) 0 D) -3 E) 3	Logarithmic Equations.
The sum of solutions of the equation $\log_2(x-1) = 2 - \log_2(x+1)$ is A) 0 B) 5 C) $\sqrt{5}$ D) $-\sqrt{5}$ E) -5	Logarithmic Equations.
If $x = k$ is the solution of $\log_3(\log_4(x-36)) = 1$, then $\log k =$ A) 6 B) -1 C) 3 D) 2 E) 1	Logarithmic Equations.

The solution set of the equation $\log_4(x+2) - 2\log_{\frac{1}{16}}(x-1) = 1$ consists of A) one positive integer only B) one negative integer only C) one positive irrational number only D) two integers whose sum is - 1 E) one negative irrational number only	Logarithmic Equations.
If the graph of the function $f(x) = \log_5(x-20)$ intersects the graph of the function $g(x) = \log_5\left(\frac{1}{x}\right) + 3$ at the point (a, b), then $a + b =$ A) 26 B) 25 C) 28 D) 21 E) 29	Logarithmic Equations.
The sum of all the solutions of the equation $\frac{1}{2}\ln(3x+8) = \frac{1}{2}\ln(2x+2) + \frac{1}{4}\log_{\sqrt{e}}(x-2)$ is A) 4 B) $\frac{5}{2}$ C) 3 D) $\frac{1}{2}$ E) 5	Logarithmic Equations.

The sum of all solutions of the equation $[\log_2(x+3)]^2 = 4\log_2(x+3)$ is A) 11 B) 6 C) 13 D) 5 E) 4	Logarithmic Equations.
The product of the solution(s) of the equation $\log_7(x-1) - \log_{1/7}(x+1) = 2\log_{\sqrt{7}} 1 + \log_7(2x-1)$ is A) 2 B) 0 C) 3 D) 4 E) 6	Logarithmic Equations.
The sum of all solution(s) of the equation $\log_2 \sqrt[3]{x+5} + \log_8(3x-1) = 2$ is A) 3 B) 14 C) 11 D) 10 E) -6	Logarithmic Equations.

The sum of all solution(s) of the equation $\log_2 \sqrt{x-2} + \log_4(x-4) = \frac{1}{2}[3 + \log_2(3)]$ is: A) 8 B) 6 C) 11 D) 10 E) -6	Logarithmic Equations.
The sum of all the solution(s) of the equation $\log_{(x^2+2x)} 27 = 3$ is A) -2 B) -4 C) -3 D) 4 E) 1	Logarithmic Equations.
The sum of all the solution(s) of the equation $\log(5x) - \log_{0.1}(x-1) = 2$, is A) 5 B) -4 C) 4 D) 1 E) 9	Logarithmic Equations.

If $(\log_4 5)(\log_{25} 2x) = 1$, then $x = ?$ A) 8 B) 6 C) 4 D) 2 E) 10	Logarithmic Equations.
The sum of all the solution(s) of the equation $\log_{\sqrt{5}}(x) + \log_5(x^2 - 3) + \log_{1/5} 4 = 0$ is A) 2 B) 4 C) 0 D) 3 E) 6	Logarithmic Equations.
If $\log_3(1) = -3 + \left(\frac{1}{3}\right)^{x+2}$, then $3x + 1 =$ A) -8 B) - 2 C) 0 D) 3 E) 10	Exponential and Logarithmic Equations.

If $\log_2 y = x$, then $\left(\frac{1}{8}\right)^{1-x} =$ A) $\frac{y^3}{8}$ B) $\frac{y^3}{2}$ C) $\frac{y}{8}$ D) $8y$ E) $8y^3$	Exponential and Logarithmic Equations.