

Topic Test: Logarithms

9 Simplify: $2e^{3\ln(x+1)}$

- A) $2(x+1)e^3$ B) $6(x+1)$ C) $3(x+1)\ln 2$
D) $2(x+1)^3$ E) NOTA

10 Find x : $\log_x x^{x^2} + \log_x x^{-5x} = \log_x \left(\frac{1}{x^6} \right)$

- A) 2 or 1 B) 2 or 3 C) 4
D) 3 or 1 E) NOTA

11 Given $\log_{10} 2 = a$, $\log_{10} 3 = b$, and $\log_{10} 7 = c$, find (in terms of a , b and c) the value of $\log_{10} \sqrt[3]{4.2}$.

- A) $\frac{a+b+c-1}{3}$ B) $\frac{abc}{3}$ C) $\sqrt[3]{a+b+c-1}$
D) $\sqrt[3]{abc}$ E) NOTA

12 Find the sum:

$$\log_2 8 + \log_4 8 + \log_8 8 + \log_{32} 8$$

- A) $\frac{65}{12}$ B) $\frac{137}{20}$ C) $\frac{3}{5}$
D) $\frac{17}{2}$ E) NOTA

13 If $\log x = p$, $\log y = q$ and $\log z = r$ and $x, y, z > 0$ then $\log \frac{x^2 y}{\sqrt[3]{z}} =$

- A) $p^2 + q^2 - \sqrt[3]{r}$ B) $\frac{p^2 q}{\sqrt[3]{r}}$ C) $2p + 2q - 3r$
D) $2pq - \frac{r}{3}$ E) NOTA

14 $\log \left(\sin \left(\frac{\pi}{12} \right) + \cos \left(\frac{\pi}{12} \right) \right) + \log \left(\cos \left(\frac{\pi}{12} \right) - \sin \left(\frac{\pi}{12} \right) \right) =$

- A) 1 B) $\log(\sqrt{3})$ C) $\log \left(\frac{\sqrt{3}}{2} \right)$
D) $\log \left(\frac{1}{2} \right)$ E) NOTA

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- 15 Simplify the expression: $\frac{\ln 4 + \ln 3 - \ln 2}{2 \ln 3 + 2 \ln 2}$
- A) $\frac{1}{6}$ B) $\frac{1}{2}$ C) $\ln 3$
D) $\frac{1}{\ln 3}$ E) NOTA
- 16 If $n > 1$ and $\log_n 3 = x$, $\log_n 5 = y$, and $\log_n 8 = z$, which of the following is equivalent to $\log_n \frac{108}{25}$?
- A) $4xyz$ B) $3x + z - 2y$ C) $3x + \frac{2}{3}z - 2y$
D) $3x + \frac{2}{3}z - \frac{1}{2}y$ E) NOTA
- 17 Find to the nearest thousandth $\sum_{k=2}^{10} (-1)^k \log k$
- A) 0.6089 B) 0.6123 C) 0.6124
D) 0.6245 E) NOTA
- 18 Solve for x : $x^{\sqrt{\log x}} = 10^8$ and give $\frac{\sqrt{x}}{\ln x}$ to the nearest hundredth.
- A) 10.86 B) 1.44 C) 542.87
D) 2714340.51 E) NOTA
- 19 If $a_{\Delta} b = \log b^a - (\log b)^a$, then find the sum of the reciprocal(s) of the real value(s) of x that satisfy $2_{\Delta} x = 0$
- A) 1.01 B) 101 C) Undefined
D) Infinite number of solutions E) NOTA

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20 Factor $64(\log x)^3 + 125y^6$

A) $(4\log x + 5y^3)(16(\log x)^2 - 20y^2 \log x + 25y^4)$

B) $(4\log x + 5y^2)(16(\log x)^2 + 20\log x^{y^2} + 25y^4)$

C) $(2\log x + 5y^2)(16(\log x)^2 - 20y^2 \log x + 25y^4)$

D) $(4\log x + 5y^2)(16(\log x)^2 - 20y^2 \log x + 25y^4)$

E) NOTA

21 $\sum_{x=1}^{52} e^{\ln x^2} + i^x$

A) $e^{\ln(521)}$

B) 48231

C) $e^{2(\ln 1 + \ln 2 + \dots + \ln 52)} + 1$

D) 48230

E) NOTA

22 Where do the graphs of $y = 3^x$ and $y = \ln x$ intersect

A) (0,1)

B) (1,0)

C) (.1, ln(.1))

D) (3, ln3)

E) NOTA

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Answers

1.	D
2.	E 2
3.	A
4.	D
5.	D
6.	C
7.	A
8.	D
9.	D
10.	B
11.	A
12.	B
13.	$E \ 2p + q - \frac{1}{3}r$
14.	C
15.	B
16.	C
17.	A
18.	A
19.	A
20.	C
21.	D
22.	E no intersection