# MATHS

## BOOKS - CENGAGE MATHS (ENGLISH)

## LOGARITHM

### Others

**1.** Solve $\log_{\log_2\left(\frac{x}{2}\right)}\left(x^2-10x+22\right)>0.$

Watch Video Solution

**2.** Solve: $(\log)_{x+\frac{1}{x}}\left(\frac{\log_2(x-1)}{x-2}\right)>0$

Watch Video Solution

**3.** $(\log)_{0.5}\dfrac{3-x}{x+2}<0$

Watch Video Solution

**4.** Solve : $(\log)_2\dfrac{x-1}{x-2}>0$

Watch Video Solution

**5.** $\log_2|x-1|<1$

Watch Video Solution

**6.** Solve : $(\log)_{(x+3)}\left(x^2-x\right)<1$

Watch Video Solution

**7.** Solve $(\log)_{0.04}(x-1)\geq(\log)_{0.2}(x-1)$

Watch Video Solution

**8.** Solve: $(\log)_3\left(2x^2+6x-5\right)>1$

Watch Video Solution

**9.** If the equation $2^x+4^y=2^y+4^x$ is solved for $y$ in terms of $x$ where $x<0$, then the sum of the solution is (a) $x(\log)_2(1-2^x)$ (b) $x+(\log)_2(1-2^x)$ (c)$(\log)_2(1-2^x)$ (d) $x(\log)_2(2^x+1)$

Watch Video Solution

**10.** If $\frac{\log x}{b-c}=\frac{\log y}{c-a}=\frac{\log z}{a-b}$, then which of the following is/are true?

Watch Video Solution

**11.** If $(\log)_2 x + (\log)_2 y \geq 6,$ then the least value of $x + y$ is 4 (b) 8 (d) 16 (d) 32

Watch Video Solution

**12.** Solve : $(\log)_{0.3}\left(x^2 - x + 1\right) > 0$

Watch Video Solution

**13.** Solve : $6\left((\log)_x 2 - (\log)_4 x\right) + 7 = 0.$

Watch Video Solution

**14.** Solve $4^{\log_2 \log_x} = \log x - (\log x)^2 + 1$ (base is e).

Watch Video Solution

**15.** Solve: $4(\log)_{\frac{x}{2}}\left(\sqrt{x}\right)+2(\log)_{4x}\left(x^2\right)=3(\log)_{2x}\left(x^3\right)$.

Watch Video Solution

**16.** Solve $4^{(\log)_9 x}-6^{(\log)_9 2}+2^{(\log)_3 27}=0$

Watch Video Solution

**17.** Solve: $\frac{1}{4}x^{los_2\sqrt{x}}=\left(2.\ x^{(\log)_2 x}\frac{1}{4}\right)$.

Watch Video Solution

**18.** Solve $|x-1|^{(\log_{10}x)^2-\log_{10}x^2=|x-1|^3}$

Watch Video Solution

**19.** Solve $(\log)_2(x-1)>4$.

Watch Video Solution

**20.** Solve $(\log)_3(x-2) \leq 2.$

Watch Video Solution

**21.** If $x_1 and x_2$ are the roots of the equation $e^2 x^{\ln x} = x^3$ with $x_1 > x_2,$

then $x_1 = 2x_2$ (b) $x_1 = x22\ 2x_1 = x22$ (d) $x12 = x23$

Watch Video Solution

**22.** If $xy^2 = 4 and (\log)_3\left((\log)_2 x\right) + (\log)_{\frac{1}{3}}\left((\log)_{\frac{1}{2}} y\right) = 1, then x equals$

4 (b) 8 (c) 16 (d) 64

Watch Video Solution

**23.** $x^{(\log)_5 x} > 5$ implies $x \in (0, \infty)$ (b) [2,2.5] (c) (2,2.5) (d) (0,2.5)

Watch Video Solution

**24.** The number of real values of the parameter $k$ for which $(\log_{16} x)^2 - (\log)_{16} x + (\log)_{16} k = 0$ with real coefficients will have exactly one solution is 2 (b) 1 (c) 4 (d) none of these

Watch Video Solution

**25.** If $S = \{x \in R : ((\log)_{0.6} 0.216)(\log)_5 (5 - 2x) \leq 0\}$, then $S$ is equal to $(2.5, \infty)$ (b) $(2, 2.5)$ (c) $(2, 2.5)$ (d) $(0, 2.5)$

Watch Video Solution

**26.** If $S = \left\{x \in N : 2 + (\log)_2 \sqrt{x+1} > 1 - (\log)_{\frac{1}{2}} \sqrt{4 - x^2}\right\}$, then $S = \{1\}$ (b) $S = Z$ (d) $S = N$ (d) none of these

Watch Video Solution

**27.** Equation

$(\log)_4(3-x)+(\log)_{0.25}(3+x)=(\log)_4(1-x)+(\log)_{0.25}(2x+1)has$

only one prime solution two real solutions no real solution (d) none of these

Watch Video Solution

**28.** Solution set of the inequality $\frac{1}{2^x-1}>\frac{1}{1-2^{x-1}}$ is $1,\infty)$ (b) $0,(\log)_2\left(\frac{4}{3}\right)$ (c) $(-1,\infty)$ $\left(0,(\log)_2\left(\frac{4}{3}\right)\cup(1,\infty)\right.$

Watch Video Solution

**29.** The solution set of the inequality $(\log)_{10}\left(x^2-16\right)\leq(\log)_{10}(4x-11)$ is $4,\infty)$ (b) $(4,5)$ (c) $\left(\frac{11}{4},\infty\right)$ (d) $\left(\frac{11}{4},5\right)$

Watch Video Solution

**30.** Which of the following is not the solution $\log_x\left(\frac{5}{2}-\frac{1}{x}\right)>\left(\frac{5}{2}-\frac{1}{x}\right)$?

Watch Video Solution

**31.** The equation $\frac{x^3}{4}\left((\log)_2 x\right)^{2+(\log)_2 x-\frac{5}{4}}=\sqrt{2}$ has at least one real solution exactly three solutions exactly one irrational solution complex roots

Watch Video Solution

**32.** Solve the following equation of $x: 2(\log)_x a+(\log)_{ax} a+3(\log)_{a^2 x} a=0, a>0$

Watch Video Solution

**33.** Solve for $x: 4^x 3^{x-1/2}=3^{x+1/2}-2^{2x-1}$.

Watch Video Solution

**34.** If P is the number of natural numbers whose logarithms to the base 10 have the the charecteristic p and Q is the numbers of natural numbers logarithms of whose reciprocal to the base 10 have the charecteristics -q. then find the value of $\log_{10} P - \log_{10} Q$

Watch Video Solution

**35.** Find the compound interest on Rs. 12000 for 10 years at the rate of 12% per annum compounded annually.

Watch Video Solution

**36.** If

$x = (\log)_{2a} a, y = (\log)_{3a} 2a, z = (\log)_{4a} 3a, provethat 1 + xyz = 2yz\cdot$

Watch Video Solution

**37.** Let $L$ denote antilog_32 0.6 and M denote the number of positive integers which have the characteristic 4, when the base of log is 5, and N denote the value of $49^{(1-(\log)_7 2)}+5^{-(\log)_5 4}$. Find the value of $\frac{LM}{N}$.

Watch Video Solution

**38.** Let $x=(0.15)^{20}$. Find the characteristic and mantissa of the logarithm of $x$ to the base 10. Assume $(\log)_{10}2=0.301 and (\log)_{10}3=0.477$.

Watch Video Solution

**39.** Using logarithms, find the value of 6.45 x 981.4

Watch Video Solution

**40.** In the 2001 census, the population of India was found to be $8.\ 7x10^7$. If the population increases at the rate of 2.5% every year, what would be the population in 2011?

Watch Video Solution

**41.** If $(\log)_{10}2 = 0.\ 30103, (\log)_{10}3 = 0.\ 47712,$ then find the number of digits in $3^{12} \cdot 2^8$

Watch Video Solution

**42.** If $a = (\log)_{12}18, b = (\log)_{24}54,$ then find the value of $ab + 5(a - b)$.

Watch Video Solution

**43.** Solve the equations for $x$ and $y$: $(3x)^{\log 3} = (4y)^{\log 4}, 4^{\log x} = 3^{\log y}$.

Watch Video Solution

**44.** If $(\log)_k x \dot{\log}_5 k = (\log)_x 5, k \neq 1, k > 0,$ then $x$ is equal to $k$ (b) 1/5 (c) 5 (d) none of these

Watch Video Solution

**45.** If $p, q \in N$ satisfy the equation $x^{\sqrt{x}} = \left(\sqrt{x}\right)^x,$ then $pandq$ are (a)relatively prime (b) twin prime (c) coprime (d)if $(\log)_q p$ is defined, then $(\log)_p q$ is not and vice versa

Watch Video Solution

**46.** Solution set of the inequality $(\log)_{0.8}\left((\log)_6 \frac{x^2 + x}{x + 4}\right) < 0$ is

A. $(-4, -3)$

B. $(-3, 4) \cup (8, \infty)$

C. $(-3, \infty)$

D. $(-4, -3) \cup (8, \infty)$

**Answer: D**

Watch Video Solution

**47.** Which of the following is not the solution of $(\log)_3(x^2 - 2) < (\log)_3\left(\frac{3}{2}|x| - 1\right)$ is $(\sqrt{2}, 2)$ (b) $(-2, -\sqrt{2})$ $(-\sqrt{2}, 2$ (d) none of these

Watch Video Solution

**48.** The true solution set of inequality $(\log)_{(x+1)}(x^2 - 4) > 1$ is equal to (a) $(2, \infty)$ (b) $\left(2, \frac{1+\sqrt{21}}{2}\right)$ (c) $\left(\frac{1-\sqrt{21}}{2}, \frac{1+\sqrt{21}}{2}\right)$ (d) $\left(\frac{1+\sqrt{21}}{2}, \infty\right)$

Watch Video Solution

**49.** Solve the following equation of $x: 2(\log)_x a + (\log)_{ax} a + 3(\log)_{a^2 x} a = 0, a > 0$

Watch Video Solution

**50.** The $x, y, z$ are positive real numbers such that $(\log)_{2x} z = 3, (\log)_{5y} z = 6, and (\log)_{xy} z = \frac{2}{3}$, then the value of $\left(\frac{1}{2z}\right)$ is .....

Watch Video Solution

**51.** Which of the following, when simplified, reduces to unity? (a) $(\log)_{10} 5 \log_{10} 20 + \left((\log)_{10} 2\right)^2$ (b) $\frac{2\log 2 + \log 3}{\log 48 - \log 4}$. (c) $-(\log)_5 (\log)_3 \sqrt{5\sqrt{9}}$ (d) $\frac{1}{6}(\log)_{\frac{\sqrt{3}}{2}} \left(\frac{64}{27}\right)$

Watch Video Solution

**52.** If $(\log)_a x = b$ for permissible values of $a$ and $x$, then identify the statement(s) which can be correct. (a)If $a$ and $b$ are two irrational numbers, then $x$ can be rational. (b)If $a$ is rational and $b$ is irrational, then $x$ can be rational. (c)If $a$ is irrational and $b$ is rational, then $x$ can be rational. (d)if $aandb$ are rational, then $x$ can be rational.

Watch Video Solution

**53.** The number of positive integers satisfying $x + (\log)_{10}(2^x + 1) = x(\log)_{10}5 + (\log)_{10}6$ is.....

A. $1$

B. $6$

C. $3$

D. $4$

**Answer: A**

Watch Video Solution

**54.** Solve: $\left(\frac{1}{2}\right)^{\log^{10a^2}} + 2 > \frac{3}{2^{(\log)_{10}(-a)}}$

Watch Video Solution

**55.** Write the characteristic of each of the following numbers by using their standard forms: 1235.5 (ii) 346.41 (iii) 62.723 (iv) 7.12345 0.35792 (vi) 0.034239 (vii) 0.002385 (viii) 0.0009468

Watch Video Solution

**56.** Solve: $(\log)_{0.1}\left((\log)_2\left(\frac{x^2+1}{x-1}\right)\right) < 0$

Watch Video Solution

**57.** Solve: $\frac{x-1}{(\log)_3(9-3^x)-3} \leq 1.$

Watch Video Solution

Watch Video Solution

**58.** Find the mantissa of the logarithm of the number 0.002359

Watch Video Solution

**59.** Use the logarithm tables to find the logarithm of the following numbers (1)25795 (ii)25.795

Watch Video Solution

**60.** Write the significant digits in each of the following numbers to compute the mantissa of their logarithms: 3.239 (ii) 8 (iii) 0.9 (iv) 0.02 0.0367 (vi) 89 (vii) 0.0003 (viii) 0.00075

Watch Video Solution

**61.** Find the mantissa of the logarithm of the number 5395

Watch Video Solution

**62.** Find the antilogarithm of each of the following: 2.7523 (ii) 3.7523 (iii) 5.7523 (iv) 0.7523 1.7523 (vi) 2.7523 (vii) 3.7523

Watch Video Solution

**63.** Evaluate $(72.3)^{\frac{1}{3}}$ if $\log 0.723 = 1.8591$.

Watch Video Solution

**64.** Integral value of $x$ which satisfies the equation $= \log_6 54 + (\log)_x 16 = (\log)_{\sqrt{2}} x - (\log)_{36}\left(\frac{4}{9}\right) is..$

Watch Video Solution

**65.** If $(\log)_4 A = (\log)_6 B = (\log)_9 (A+B), then \left[4\left(\frac{B}{A}\right)\right]$ (where [ ] represents the greatest integer function) equals .....

Watch Video Solution

**66.** The value of $(\log_{10} 2)^3 + \log_{10} 8 \log_{10} 5 + (\log_{10} 5)^3$ is .....

Watch Video Solution

**67.** If $(\log)_a b = 2, (\log)_b c = 2,$ and $(\log)_3 c = 3 + (\log)_3 a,$ then the value of $c/(ab)$ is.....

A. 2

B. 3

C. $-2$

D. $-3$

**Answer: B**

Watch Video Solution

**68.** The inequality $\sqrt{x^{(\log)_2\sqrt{x}}} \geq 2$ is satisfied by (A) only one value of $x$ (B) $x \in \left(0, \left(\frac{1}{4}\right)\right]$ $(C)x \in [4, \infty)$ (d) $x \in (1, 2)$

Watch Video Solution

**69.** The value of $\left(6a^{(\log)_{e^b}}\left((\log)_{a^2}b\right)\frac{(\log)_{b^2}a}{e^{(\log)_e a(\log)_{e^b}}}is\right.$ (a) independent of $a$ (b) independent of $b$ (c)independent of $a$and b (d) dependent on $b$

Watch Video Solution

**70.** If $(\log)_{10}5 = aand(\log)_{10}3 = b, then \quad (A)(\log)_{30}8 = \frac{3(1-a)}{b+1}$ $(B)(\log)_{40}15 = \frac{a+b}{3-2a}$ $(C)(\log)_{243}32 = \frac{1-a}{b}$ (d) none of these

Watch Video Solution

**71.** The equation $(\log)_{x+1}(x-.5)=(\log)_{x-0.5}(x+1)$ has (A) two real solutions (B) no prime solution (C) one integral solution (D) no irrational solution

Watch Video Solution

**72.** Sum of all integral values of $x$ satisfying the inequality $\left(3^{\left(\frac{5}{2}\right)\log(12-3x)}\right)-\left(3^{\log x}\right)>32$ is.....

Watch Video Solution

**73.** The difference of roots of the equation $\left((\log)_{27}x^3\right)^2=(\log)_{27}x^6$ is .....

Watch Video Solution

**74.** Number of integers satisfying the inequality $(\log)_{\frac{1}{2}}|x-3| \succ 1$ is.....

Watch Video Solution

**75.** The number of elements in set of all $x$ satisfying the equation $x^{\log_3 x^2 + (\log_3 x)^2 - 10} = \frac{1}{x^2} is$ (a)1 (b) 2 (c) 3 (d) 0

Watch Video Solution

**76.** Number of real values of $x$ satisfying the equation $\log_2(x^2 - x) \cdot \log_2\left(\frac{x-1}{x}\right) + (\log_2 x)^2 = 4$,is

A. 0

B. 2

C. 3

D. 4

**Answer: B**

Watch Video Solution

**77.** Let $a > 1$ be a real number. Then the number of roots equation $a^{2(\log)_2 x} = 15 + 4x^{(\log)_2 a}$ is 2 (b) infinite (c) 0 (d) 1

Watch Video Solution

**78.** Number of integers $\leq 10$ satisfying the inequality $2(\log)_{\frac{1}{2}}(x-1) \leq \frac{1}{3} - \frac{1}{(\log)_{x^2-x}8}$ is.....

A. 7

B. 8

C. 9

D. 10

**Answer: C**

Watch Video Solution

**79.** The number of roots of the equation $(\log)_{3\sqrt{x}}x+(\log)_{3x}\sqrt{x}=0$ is 1

(b) 2 (c) 3 (d) 0

Watch Video Solution

**80.** The value of $(\log)_{\sqrt{4+2\sqrt{2}}\sqrt{4-2\sqrt{2}}}2^9$ is.....

Watch Video Solution

**81.** Find the value of $(\log)_2(293-2)+(\log)_2(1233+4+493)$.

Watch Video Solution

**82.** Find the number of solutions of the following equations:

$x^{-\frac{1}{2}}(\log)_{0.5}x=1\ x^2-4x+3-(\log)_2x=0$

Watch Video Solution

**83.** Find the number of solution to equation $(\log)_2(x+5) = 6 - x$:

Watch Video Solution

**84.** Solve : $2(25)^x - 5(10^x) + 2(4^x) \geq 0.$

Watch Video Solution

**85.** If

$$\frac{x(y+z-x)}{\log x} = \frac{y(z+x-y)}{\log y} = \frac{z(x+y-z)}{\log z}, prove that x^y y^x = z^x y^z =$$

Watch Video Solution

**86.** If $(\log)_3 y = x and (\log)_2 z = x,$ find $72^x$ in terms of $y$ and $z$.

Watch Video Solution

**87.** If $(\log)_a 3 = 2 \text{and} (\log)_b 8 = 3$, then prove that $(\log)_a b = (\log)_3 4$.

Watch Video Solution

**88.** Find the value of $\log \tan 1^0 \log \tan 2^0 \ldots\ldots\ldots . \log \tan 89^0$

Watch Video Solution

**89.** Sum of integers satisfying $\sqrt{(\log)_2 x - 1} - \frac{1}{2}(\log)_2 \left(x^3\right) + 2 > 0$ is.....

Watch Video Solution

**90.** The value of $b$ for which the equation $2(\log)_{\frac{1}{25}}(bx + 28) = -(\log)_5 \left(12 - 4x - x^2\right)$ has coincident roots is

A. $b = -12$

B. $b = 4 \quad \text{or} \quad b = -12$

C. $b = 4 \quad \text{or} \quad b = 12$

D. $b = -12$

**Answer: B**

Watch Video Solution

**91.** The least integer greater than $(\log)_2(15) \cdot (\log)_{\frac{1}{6}} 2 \cdot (\log)_3 \frac{1}{6}$ is .....

Watch Video Solution

**92.** The reciprocal of $\frac{2}{(\log)_4(2000)^6} + \frac{3}{(\log)_5(2000)^6}$ is .....

Watch Video Solution

**93.** The value of $5^{(\log)_{\frac{1}{5}}\left(\frac{1}{2}\right)}+(\log)_{\sqrt{2}}\frac{4}{\sqrt{7}+\sqrt{3}}+(\log)_{\frac{1}{2}}\frac{1}{10+2\sqrt{21}}$ is.....

Watch Video Solution

**94.** The value of $N=\frac{(\log)_5 250}{(\log)_{50}5}-\frac{(\log)_5 10}{(\log)_{1250}5}$ is.....

Watch Video Solution

**95.** If $x and y$ are real numbers such that $2\log(2y-3x)=\log x+\log y$ ,then find $\frac{x}{y}$.

Watch Video Solution

**96.** If $\log_e\left(\frac{a+b}{2}\right)=\frac{1}{2}(\log_e a+\log_e b)$, then find the relation between $a and b$.

Watch Video Solution

**97.** If $2x^{(\log)_4 3} + 3^{(\log)_4 x} = 27,$ then $x$ is equal to

Watch Video Solution

**98.** The value of $\log ab - \log|b| =$ $\log a$ (b) $\log|a|$ (c) $-\log a$ (d) none of these

Watch Video Solution

**99.** If $(21.4)^a = (0.00214)^b = 100$, then the value of $\frac{1}{a} - \frac{1}{b}$ is 0 (b) 1 (c) 2 (d) 4

Watch Video Solution

**100.** Given that $\log(2) = 0.3010,$ the number of digits in the number $2000^{2000}$ is 6601 (b) 6602 (c) 6603 (d) 6604

Watch Video Solution

**101.** The number of $N = 6 - \left(6(\log)_{10}2 + (\log)_{10}31\right)$ lies between two successive integers whose sum is equal to (a)5 (b) 7 (c) 9 (c) 10

Watch Video Solution

**102.** $(\log)_4 18$ is a rational number (b) an irrational number (c)a prime number (d) none of these

Watch Video Solution

**103.** Solve:

$(\log)_{(2x+3)}\left(6x^2 + 23x + 21\right) + (\log)_{(3x+7)}\left(4x^2 + 12x + 9\right) = 4$

Watch Video Solution

**104.** Given $aandb$ are positive numbers satisfying $4(\log_{10} a)^2 + \left((\log)_2 b\right)^2 = 1$. Find the range of values of $aandb$.

Watch Video Solution

**105.** If $\frac{(\log)_a N}{(\log)_c N} = \frac{(\log)_a N - (\log)_b N}{(\log)_b N - (\log)_c N}, whereN > 0andN \neq 1, a, b, c > 0$ and not equal to 1, then prove that $b^2 = ac$

Watch Video Solution

**106.** If $(\log)_b a(\log)_c a + (\log)_a b(\log)_c b + (\log)_a c(\log)_b c = 3$ (where $a, b, c$ are different positive real numbers $\neq 1$), then find the value of $abc$.

Watch Video Solution

**107.** Solve for: $x : (2x)^{(\log)_b 2} = (3x)^{(\log)_b 3}$.

Watch Video Solution

**108.** Let $a = (\log)_3(\log)_3 2$. An integer $k$ satisfying $1 < 2^{-k+3^{(-a)}} < 2$, must be less than .....

Watch Video Solution

**109.** The value of $6 + (\log)_{\frac{3}{2}}\left[\frac{1}{3\sqrt{2}} \cdot \sqrt{\left(4 - \frac{1}{3\sqrt{2}}\right)\sqrt{4 - \frac{1}{3\sqrt{2}}\ldots\ldots}}\right]$ is .....

A. $3\sqrt{2}$

B. $\sqrt{2}$

C. $4$

D. $6$

**Answer: C**

Watch Video Solution

**110.** $(\log)_{x-1}x(\log)_{x-2}(x-1)\ldots..(\log)_{x-12}(x-11)=2$, $x$ is equal to:

9 (b) 16 (c) 25 (d) none of these

Watch Video Solution

**111.** If $f(x)=\log\left(\frac{1+x}{1-x}\right), then$ (a)$f(x_1)f(x)=f(x_1+x_2)$ (b) $f(x+2)-2f(x+1)+f(x)=0$ (c)$f(x)+f(x+1)=f\left(x^2+x\right)$ (d) $f(x_1)+f(x_2)=f\left(\frac{x_1+x_2}{1+x_1x_2}\right)$

View Text Solution

**112.** If $a, b, c$ are consecutive positive integers and $(\log(1+ac)=2K,$ then the value of $K$ is (a) $\log b$ (b) $\log a$ (c) 2 (d) 1

Watch Video Solution

**113.** If $\frac{a+(\log)_4 3}{a+(\log)_2 3}=\frac{a+(\log)_8 3}{a+(\log)_4 3}=b$ ,then b is equal to $\frac{1}{2}$ (2) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{3}{2}$

Watch Video Solution

**114.** If $p>1$ and $q>1$ are such that $\log(p+q)=\log p+\log q$, then the value of $\log(p-1)+\log(q-1)$ is equal to (a) 0 (b) 1 (c) 2 (d) none of these

Watch Video Solution

**115.** The value of $\frac{1+2(\log)_3 2}{\left(1+(\log)_3 2\right)^2}+\left((\log)_6 2\right)^2$ is 2 (b) 3 (c) 4 (d) 1

Watch Video Solution

**116.** If $(\log)_4 5=a and (\log)_5 6=b,$ then $(\log)_3 2$ is equal to $\frac{1}{2a+1}$ (b) $\frac{1}{2b+1}$ (c) $2ab+1$ (d) $\frac{1}{2ab-1}$

Watch Video Solution

**117.** If $(\log)_{10}2 = a, (\log)_{10}3 = bthen(\log)_{0.72}(9.6)$ in terms of $a$ and $b$ is equal to (a) $\frac{2a+3b-1}{5a+b-2}$ (b) $\frac{5a+b-1}{3a+2b-2}$ (c) $\frac{3a+b-2}{2a+3b-1}$ (d) $\frac{2a+5b-2}{3a+b-1}$

Watch Video Solution

**118.** There exists a natural number $N$ which is 50 times its own logarithm to the base 10, then $N$ is divisible by

Watch Video Solution

**119.** The value of $\frac{(\log)_2 24}{(\log)_{96}2} - \frac{(\log)_2 192}{(\log)_{12}2}$ is 3 (b) 0 (c) 2 (d) 1

Watch Video Solution

**120.** Find the number of solutions of equation $(2x-3)2^x=1$

Watch Video Solution

**121.** Find the value of $(\log)_{2\sqrt{3}}1728$.

Watch Video Solution

**122.** Prove that $\frac{1}{3}<(\log)_{10}3<\frac{1}{2}$.

Watch Video Solution

**123.** Arrange $(\log)_2 5$, $(\log)_{0.5}5$, $(\log)_7 5$, $(\log)_3 5$ in decreasing order.

Watch Video Solution

**124.** If $3^x = 4^{x-1}$, then $x =$ $\frac{2(\log)_3 2}{2(\log)_3 2 - 1}$ (b) $\frac{2}{2 - (\log)_2 3}$ $\frac{1}{1 - (\log)_4 3}$

(d) $\frac{2(\log)_2 3}{2(\log)_2 3 - 1}$

Watch Video Solution

**125.** Solve: $|x - 3|^{3x^2 - 10x + 3} = 1$

Watch Video Solution

**126.** Find the smallest integral value of $x$ satisfying $(x - 2)^{x^2 - 6x + 8}) > 1$

Watch Video Solution

**127.** The least value of the expression $2(\log)_{10} x - (\log)_x (0.01)\cdot$ for $x > 1$

is (a)10 (b)2 (c) $-0.01$ (d)4

Watch Video Solution

**128.** The solution of the equation $(\log)_7(\log)_5\left(\sqrt{x+5}+\sqrt{x}=0\right.$ is...

Watch Video Solution

**129.** Let $(x_0, y_0)$ be the solution of the following equations: $(2x)^{1n2}=(3y)^{1n3}$ $3^{1nx}=2^{1ny}$ The $x_0$ is $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) 6

Watch Video Solution

**130.** If $\ln(a+c), \ln(a-c), \ln(a-2b+c)$ are in $A\dot{P}$; then $a, b, c, are \in A\dot{P}$. (b) $a^2, b^2, c^2 are \in A\dot{P}$. $a, b, c$ are in $G\dot{P}$. (d) $a, b, c$ are in $H\dot{P}$.

Watch Video Solution

**131.** Prove that number $(\log)_2 7$ is an irrational number.

Watch Video Solution

**132.** Which of the following numbers are positive/negative? $(\log)_2 7$ (ii) $(\log)_{0.2} 3$ (iii) $(\log)_{1/3}\left(\frac{1}{5}\right)$ (iv) $(\log)_4 3$ (v) $(\log)_2((\log)_2 9)$

Watch Video Solution

**133.** If $(\log)_3 2, (\log)_3(2^x - 5) and (\log)_3\left(2^x - \frac{7}{2}\right)$ are in arithmetic progression, determine the value of $x$.

Watch Video Solution

**134.** Solve $x^{(\log)_y x} = 2 and y^{(\log)_x y} = 16$

Watch Video Solution

**135.** Solve $(\log)_{2x} 2 + (\log)_4 2x = -3/2.$

Watch Video Solution

**136.** If $a \geq b > 1,$ then find the largest possible value of the expression $(\log)_a\left(\frac{a}{b}\right) + (\log)_b\left(\frac{b}{a}\right).$

Watch Video Solution

**137.** Solve : $3^{(\log_9 x)} \times 2 = 3\sqrt{3}$

Watch Video Solution

**138.** Solve the inequality $\sqrt{(\log)_2\left(\frac{2x-3}{x-1}\right)} < 1$

A. $x \in (2, \infty)$

B. $x \in (-\infty, 1)$

C. $x \in (-2, \infty)$

D. $x \in (-\infty, 1) \cup \left(\frac{3}{2}, \infty\right)$

**Answer: A**

Watch Video Solution

**139.** Find the number of solutions of equation $2^x + 3^x + 4^x - 5^x = 0$

Watch Video Solution

**140.** If $y = a^{\frac{1}{1-(\log)_{a^x}}}$ and $z = a^{\frac{1}{1-(\log)_{a^y}}}$ ,then prove that $x = a^{\frac{1}{1-(\log)_{a^z}}}$

Watch Video Solution

**141.** Solve $(\log)_x 2(\log)_{2x} 2 = (\log)_{4x} 2.$

Watch Video Solution

**142.** Let $a, b, c, d$ be positive integers such that $(\log)_a b = \frac{3}{2} and (\log)_c d = \frac{5}{4}$. If $(a - c) = 9$, then find the value of $(b - d)$.

Watch Video Solution

**143.** Solve $\sqrt{\log(-x)} = \log \sqrt{x^2}$ (base is 10).

Watch Video Solution

**144.** If $(\log)_3\{5 + 4(\log)_3(x - 1)\} = 2$, then $x$ is equal to 4 (b) 3 (c) 8 (d) $(\log)_2 16$

Watch Video Solution

**145.** If $(\log)_{10}\left[\frac{1}{2^x + x - 1}\right] = x\left[(\log)_{10} 5 - 1\right]$, then $x =$ 4 (b) 3 (c) 2 (d) 1

Watch Video Solution

**146.** The value of $x$ satisfying the equation $3\sqrt{5}^{(\log_5)5^{\left((\log)_5(\log)_5\log_5\left(\frac{x}{2}\right)\right)}=3}$ 1

(b) 3 (c) 18 (d) 54

Watch Video Solution

**147.** If $2^{x+y}=6^y$ and $3^{x-1}=2^{y+1}$, then the value of $(\log 3-\log 2)(x-y)$ is

A. 1

B. $(\log)_2 3-(\log)_3 2$

C. $\log\left(\frac{3}{2}\right)$

D. none of these

**Answer: C**

Watch Video Solution

**148.** The value of $3^{(\log)_4 5} - 5^{(\log)_4 3}$ is 0 (b) 1 (c) 2 (d) none of these

Watch Video Solution

**149.** If $a^4 b^5 = 1$ then the value of $\log_a\left(a^5 b^4\right)$ equals

Watch Video Solution

**150.** If

$(\log)_2 x + (\log)_x 2 = \frac{10}{3} = (\log)_2 y + (\log)_y 2 and x \neq y, the x + y =$ 2

(b) 65/8 (c) 37/6 (d) none of these

Watch Video Solution

**151.** If $(x+1)^{(\log)_{10}(x+1)} = 100(x+1),$ then all the roots are positive real numbers all the roots lie in the interval (0,100) all the roots lie in the interval [-1,99]

Watch Video Solution

**152.** if $(\log)_y x + (\log)_x y = 2, x^2 + y = 12,$ the value of $xy$ is 9 (b) 12 (c) 15 (d) 30

Watch Video Solution

**153.** If $\sqrt{(\log)_2 x} - 0.5 = (\log)_2 \sqrt{x,}$ then $x$ equals odd integer (b) prime number composite number (d) irrational

Watch Video Solution

**154.** Find the value of $81^{(1/\log_5 3)} + \left(27^{\log_9 36}\right) + 3^{\left(\frac{4}{\log_7 9}\right)}$

Watch Video Solution

**155.** Find the value of $\left(\frac{1}{49}\right)^{1+(\log)_7 2} + 5^{-1(\log)_{\left(\frac{1}{5}\right)}(7)}$

Watch Video Solution

**156.** Prove that:

$$2\left(\sqrt{(\log)_a 4\sqrt{ab}+(\log)_b 4\sqrt{ab}}-\sqrt{(\log)_a 4\sqrt{\frac{b}{a}}+(\log)_b 4\sqrt{\frac{a}{b}}}\right)\sqrt{(\log)_a b}=\begin{cases}2 & \text{if } b\geq a\\ \text{if } 1\end{cases}$$

Watch Video Solution

**157.** Prove that $\frac{2^{(\log)_{2\frac{1}{4}}x}-3^{(\log)_{27}\left(x^2+1\right)^3}-2x}{7^{4(\log)_{49}x}-x-1}>0$

Watch Video Solution

**158.** Solve $(\log)_4 8+(\log)_4(x+3)-(\log)_4(x-1)=2.$

Watch Video Solution

**159.** Which of the following pairs of expression are defined for the same set of values of $x$ ? $f_1(x) = 2(\log)_2 x and f_2(x) = (\log)_{10} x^2$

$f_1(x) = (\log) x^2_{\times} and f_2(x) = 2$

$f_1(x) = (\log)_{10}(x-2) + (\log)_{10}(x-3) and f_{2(x)} = (\log)_{10}(x-2)(x-3)$

Watch Video Solution

**160.** Solve $(\log)_2(3x-2) = (\log)_{\frac{1}{2}} x$

Watch Video Solution

**161.** Solve $\log(-x) = 2\log(x+1)$.

Watch Video Solution

**162.** Solve: $(\log)_2(4.3^x - 6) - (\log)_2(9^x - 6) = 1$.

Watch Video Solution

**163.** Solve $2^{x+2}27^{x/(x-1)} = 9$

Watch Video Solution

**164.** Suppose $x, y, z = 0$ and are not equal to 1 and $\log x + \log y + \log z = 0.$ Find the value of $\frac{1}{x^{\log y}} + \frac{1}{\hat{}(\log z)}\frac{1}{y^{\log z}} + \frac{1}{\hat{}(\log x)}\frac{1}{z^{\log x}} + \frac{1}{\hat{}(\log y)}$

Watch Video Solution

**165.** If $(\log)_{12}27 = a,$ then find $(\log)_6 16 \int ermsofa$

Watch Video Solution

**166.** If $y^2 = xz$ and $a^x = b^y = c^z,$ then prove that $(\log)_a b = (\log)_b c$

Watch Video Solution

**167.** Simplify: $\frac{1}{1+(\log)_a bc}+\frac{1}{1+(\log)_b ca}+\frac{1}{1+(\log)_c ab}$

Watch Video Solution

**168.** If $a^x=b, b^y=c, c^z=a,$ then find the value of $xyz$.

Watch Video Solution

**169.** Find the value of $((\log)_3 4)((\log)_4 5)((\log)_5 6)((\log)_6 7)((\log)_7 8)((\log)_8 9)$.

Watch Video Solution

**170.** $y=2^{\frac{1}{(\log)_{x^4}}}$, then find x in terms of y.

Watch Video Solution

**171.** If $n > 1$, *then prove that*

$$\frac{1}{(\log)_2 n} + \frac{1}{(\log)_3 n} + + \frac{1}{(\log)_{53} n} = \frac{1}{(\log)_{53!} n}.$$

Watch Video Solution

**172.** What is logarithm of $32\sqrt[5]{4}$ to the base $2\sqrt{2}$?

Watch Video Solution

**173.** Which is greater: $x = (\log)_3 5$ or $y = (\log)_{17} 25$?

Watch Video Solution

**174.** The product of roots of the equation $\frac{3}{(\log_8 x)^2} = 3$ is 1 (b) (c) 1/3 (d) $1/4$

Watch Video Solution