MATHS

BOOKS - ARIHANT MATHS (HINGLISH)

LOGARITHM AND THEIR PROPERTIES

Examples

1. Find the value of the following

$\log_9 27$

Watch Video Solution

2. $\log_{3\sqrt{2}} 324$

Watch Video Solution

3. Find the value of the following

$\log_{1/9}(27\sqrt{3})$

Watch Video Solution

4. Find the value of the following

$\log_{(5+2\sqrt{6})}(5-2\sqrt{6})$

Watch Video Solution

5. Find the value of the following

$\log_{0.2} 0.008$

Watch Video Solution

6. Find the value of the following

$2^{\log_4 5}$

Watch Video Solution

Watch Video Solution

7. $(0.4)^{-\log 2.5\left\{\frac{1}{3}+\frac{1}{3^2}+\frac{1}{3^3}+\ldots.\right\}}$

Watch Video Solution

8. Find the value of the following $(0.05)^{\log_{\sqrt{20}}(0.\bar{3})}$

Watch Video Solution

9. Find the value of the following $\log_{\cot 30^\circ} \tan 45^\circ$

Watch Video Solution

10. Find the value of the following

$\log_{(\sec^2 60^\circ - \tan^2 60^\circ)} \cos 60^\circ$

Watch Video Solution

11. Find the value of the following

$\log_{(\sin^2 30^\circ + \cos^2 30^\circ)} 1$

Watch Video Solution

12. Find the value of the following

$\log_{30} 1$

Watch Video Solution

13. If log2=0.301 and log3=0.477, find the number of integers in

(ii) 6^{20}

Watch Video Solution

14. Find the numbers of zeroes between the decimal point and first significant digit of $(0.036)^{16}$, where $\log 2 = 0.301$ and $\log 3 = 0.477$.

Watch Video Solution

15. Solve the equation $3 \cdot x^{\log 5^2} + 2^{\log 5^x} = 64.$

Watch Video Solution

16. If $4^{\log 16^4} + 9^{\log 3^9} = 10^{\log x^{83}}$, find x.

Watch Video Solution

17. Prove that $a\sqrt{\log_a b} - b\sqrt{\log_b a} = 0$

Watch Video Solution

18. Prove that $\dfrac{\log_2(24)}{\log_{96} 2} - \dfrac{\log_2(192)}{\log_{12} 2} = 3$

Watch Video Solution

19. Solve for a,λ if $\log_{\lambda} a \cdot \log_{5} \lambda \cdot \log_{\lambda} 25 = 2.$

Watch Video Solution

20. Arrange in ascending order

$\log_{2}(x), \log_{3}(x), \log_{e}(x), \log_{10}(x)$, if

I.$x > 1$

Watch Video Solution

21. Arrange in ascending order

$\log_{2}(x), \log_{3}(x), \log_{e}(x), \log_{10}(x)$, if

II.$0 < x < 1.$

Watch Video Solution

22. If log 11=1.0414, prove that $10^{11} > 11^{10}.$

Watch Video Solution

Watch Video Solution

23. If $\log_2(x-2) < \log_4(x-2)$,, find the interval in which x lies.

Watch Video Solution

24. Prove that $\log_n(n+1) > \log_{n+1}(n+2)$ for any natural number $n > 1.$

Watch Video Solution

25. For $x > 1$, the minimum value of $2\log_{10}(x) - \log_x(0.01)$ is

Watch Video Solution

26. Which is smaller 2 or $(\log_\pi 2 + \log_2 \pi)$

Watch Video Solution

27. The expression $\log_2 5 - \sum_{k=1}^{4} \log_2\left(\sin\left(\frac{k\pi}{5}\right)\right)$ reduces to $\frac{p}{q}$, where p and q are co-prime, the value of $p^2 + q^2$ is

A. 13

B. 17

C. 26

D. 29

Answer: B

Watch Video Solution

28. If $3 \leq a \leq 2015, 3 \leq b \leq 2015$ such that $\log_a b + 6 \log_b a = 5$, the number of ordered pairs (a,b) of integers is

A. 48

B. 50

C. 52

D. 54

Answer: C

Watch Video Solution

29. The lengths of the sides of a traingle are $\log_{10} 12, \log_{10} 75$ and $\log_{10} n$, where $n \in N$. If a and b are the least ad greatest values of n respectively. The value of b-a is divisible by

A. 221

B. 222

C. 223

D. 224

Answer: C

Watch Video Solution

30. Let $5\log_{abc}(a^3+b^3+c^3) = 3\lambda\left(\frac{1+\log_3(abc)}{\log_3(abc)}\right)$ and $(abc)^{a+b+c} = 1$ and $\lambda = \frac{m}{n}$ m, n are relatively prime , find $|m+n| + |m-n|$

A. 8

B. 10

C. 12

D. 14

Answer: B

Watch Video Solution

31. If $a^{\log b^c} = 3.3^{\log 4^3}.3^{\left(\log 4^3\right)^{\log 4^3}}.3^{\left(\log 4^3\right)^{\left(\log 4^3\right)^{\log 4\,\hat{}\,3}}}$ ...oo

where a,b,c $\in$ Q the value of abc is -+

A. 9

B. 12

C. 16

D. 20

Answer: C

View Text Solution

32. Number of real roots of equation

$3^{\log 3\left(x^2 - 4x + 3\right)} = (x - 3)$ is

A. 0

B. 1

C. 2

D. infinite

Answer: A

Watch Video Solution

33. If $\log_6 a + \log_6 b + \log_6 c = 6$,where a,b,c, $\in$ N and a,b,c are in GP and b-a is a square of an integer, then the value of a+b-c is

A. 21

B. 15

C. 9

D. 3

Answer: B

Watch Video Solution

34. If $x = \log_{2a}\left(\frac{bcd}{2}\right), y = \log_{3b}\left(\frac{acd}{3}\right), z = \log_{4c}\left(\frac{abd}{4}\right)$ and $w = \log_{5d}\left(\frac{abc}{5}\right.$

and $\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1} + \frac{1}{w+1} = \log_{abcd} N + 1,$ then value of $\frac{N}{40}$ is

A. 40

B. 80

C. 120

D. 160

Answer: A::B::C

Watch Video Solution

35. The equation

$(\log_{10} x + 2)^3 + (\log_{10} x - 1)^3 = (2\log_{10} x + 1)^3$ has

A. no natural solution

B. two rational solutions

C. no prime solutions

D. one irritional solution

Answer: A

Watch Video Solution

36. The value of $\frac{\log_5 9 \cdot \log_7 5 \cdot \log_3 7}{\log_3 \sqrt{6}} + \frac{1}{\log_4 \sqrt{6}}$ is co-prime with

A. 1

B. 3

C. 4

D. 5

Answer: A::C::D

Watch Video Solution

37. Consider the quadratic equation $(\log_{10} 8)x^2 - (\log_{10} 5)x = 2(\log_2 10)^{-1} - x$. Which of the following quantities are irrational.

A. sum of roots

B. product of roots

C. sum of coefficients

D. discriminant

Answer: A::B

Watch Video Solution

38. Find the real solutions to the system of equations $\log_{10}(2000xy) - \log_{10} x . \log_{10} y = 4$, $\log_{10}(2yz) - \log_{10} y \log_{10} z = 1$ and $\log_{10} zx - \log_{10} z \log_{10} x = 0$

A. $x_1 + x_2 = 101$

B. $y_1 + y_2 = 25$

C. $x_1 + x_2 = 100$

D. $z_1 + z_2 = 100$

Answer: A

Watch Video Solution

39. Suppose that $\log_{10}(x-2)+\log_{10}y=0$ and $\sqrt{x}+\sqrt{y-2}=\sqrt{x+y}$. Then the value of $(x+y)$ is

Watch Video Solution

40. Suppose that $\log_{10}(x-2)+\log_{10}y=0$ and $\sqrt{x}+\sqrt{y-2}=\sqrt{x+y}$. Then the value of $(x+y)$ is

Watch Video Solution

41. Suppose that $\log_{10}(x-2)+\log_{10}y=0$ $\sqrt{x}+\sqrt{y-2}=\sqrt{x+y}$.

If $x^{2t^2-6}+y^{6-2t^2}=6$,, the value of t_1, t_2, t_3, t_4 is

Watch Video Solution

42. IF $10^{\log p\{\log q(\log r^{x})\}}$=1 and $\log_q\{\log_r(\log_p x)\} = 0.$

The value of x is

A. q^r

B. r^q

C. r^p

D. rq

Answer: B

Watch Video Solution

43. $10^{\log_p(\log_q(\log_r(x)))} = 1$ and $\log_q(\log_r(\log_p(x))) = 0,$ then 'p' is equals a. $r^{\frac{q}{r}}$ b. rq c. 1 d. $r^{\frac{r}{q}}$

A. $\log_q\{\log_r(\log_p x)\} = 0.$

B. rq

C. 1

D. $r^{r/p}$

Answer: A

Watch Video Solution

44. IF $10^{\log_p\{\log_q(\log_r x)\}}$=1 and $\log_q\{\log_r(\log_p x)\} = 0$. The value of q is

A. $r^{p/r}$

B. $p\log_p r$

C. $r\log_r p$

D. $r^{r/p}$

Answer: C

Watch Video Solution

45. If x_1 andx_2 are the solutions of the equation $x^{\log_{10} x} = 100x$ such that $x_1 > 1$ and$x_2 < 1$, the value of $\frac{x_1 x_2}{2}$ is

Watch Video Solution

46. If $(31.6)^a = (0.0000316)^b = 100$, the value of $\frac{1}{a} - \frac{1}{b}$ is

Watch Video Solution

47. Statement-1(Assertion and Statement -2 (reason) Each of these examples also has four alternative choices, only one of which is the correct answer. You have select the correct choice as given below.

Statement -1 If $N = \left(\frac{1}{0.4}\right)^{20}$, then N contains 7 digit before decimal.

Statement -2 Characteristic of the logarithm of N to the base 10 is 7.

A. Statement -1 if true, Statement-2 is true, Statement-2 is a correct explanation for Statement -1

B. Statement -1 if true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -1

C. Statement -1 if true, Statement-2 is false

D. Statement -1 if false , Statement-2 is true

Answer: D

Watch Video Solution

48. Statement-1(Assertion and Statement -2 (reason) Each of these examples also has four alternative choices, only one of which is the correct answer. You have select the correct choice as given below.

Statement-1 If p,q $\in$ N satisfy the equation $x^{\sqrt{x}} = \left(\sqrt{x}\right)^{x}$ and $q > p$, then q is a perfect number . ,ltbgt If a number is equal to the sum of its factor, then number is known as perfect number.

A. Statement -1 if true, Statement-2 is true, Statement-2 is a correct explanation for Statement -2

B. Statement -1 if true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -2

C. Statement -1 if true, Statement-2 is false

D. Statement -1 if false , Statement-2 is true

Answer: D

View Text Solution

49. Prove $\log_3(5)$ is irrational.

Watch Video Solution

50. Find the value of the expressions $(\log 2)^3 + \log 8. \log(5) + (\log 5)^3$.

Watch Video Solution

51. IF $\lambda^{\log_5 3}$=81 ,find the value of λ.

Watch Video Solution

52. Find the product of the positive roots of the equation $\sqrt{2009}(x)^{\log_{2009}(x)} = x^2$.

Watch Video Solution

53. Prove that $\log_7 11$ is greater than $\log_8 5$.

Watch Video Solution

54. Given $a^2 + b^2 = c^2$. Prove that

$\log_{b+c} a + \log_{c-b} a = 2\log_{c+b} a.\log_{c-b} a, \forall a > 0, a \neq 1$

$c - b > 0$,$c + b > 0$

$c - b \neq 1$,$c + b \neq 1$.

Watch Video Solution

55. Let $a > 0, c > 0, b = \sqrt{ac}, a, c$ and $ac \neq 1, N > 0.$

Prove that $\frac{\log_a N}{\log_c N} = \frac{\log_a N - \log_b N}{\log_b N - \log_c N}$

Watch Video Solution

56. IF

$a^x = b, b^y = c, c^z = a, x = (\log_b a)^{k1}, y = (\log_c b)^{k2}, z = (\log_a c)^{k3},$

find the minimum value of $3k_1 + 6k_2 + 12k_3$.

Watch Video Solution

57. IF $x = 1 + \log_a bc, y = 1 + \log_b ca, z = 1 + \log_c ab,$ prove that xyz=xy+yz+zx.

View Text Solution

58. If $\frac{Ina}{(b-c)} = \frac{Inb}{(c-a)} = \frac{Inc}{(a-b)}$,Prove that $a^{b+c}.\, b^{c+a}.\, c^{a+b} = 1$

Watch Video Solution

59. Simplify $5^{\log 1/5^{(1/2)}} + \log_{\sqrt{2}}\left(\frac{4}{\sqrt{7}+\sqrt{3}}\right) + \log_{1/2}\left(\frac{1}{10+2\sqrt{21}}\right)$.

Watch Video Solution

60. Find the square of the sum of the roots of the equation $\log_3 x \cdot \log_4 x \cdot \log_5 x = \log_3 x \cdot \log_4 x + \log_4 x \cdot \log_5 x + \log_3 x \cdot \log_5 x$

Watch Video Solution

61. Given that $\log_2 a = \lambda, \log_4 b = \lambda^2$ and $\log_{c^2}(8) = \frac{2}{\lambda^3+1}$ write $\log_2\left(\frac{a^2b^5}{5}\right)$ as a function of λ, $(a, b, c > 0, c \neq 1)$.

Watch Video Solution

62. Given that $\log_2(3) = a, \log_3(5) = b, \log_7(2) = c,$ express the logrithm of the number 63 to the base 140 in terms of a,b & c.

Watch Video Solution

63. Show the sum of the roots of the equation $x + 1 = 2\log_2(2^x + 3) - 2\log_4\left(1980 - 2^{-x}\right)$ is $\log_2 11$.

Watch Video Solution

64. Solve the equations $\log_{1000}|x + y| = \frac{1}{2}. \log_{10} y - \log_{10}|x| = \log_{100} 4$ for x and y

Watch Video Solution

65. Value of x, satisfying $\frac{6}{5}a^{\log_a(x) \cdot (\log_{10}(a) \cdot \log_a(5))} - 3^{\log_{10}\left(\frac{x}{10}\right)} = 9^{\log_{100}(x) + \log_4(2)}$ is :

Watch Video Solution

Watch Video Solution

66. The value of x satisfying $|x-1|^{\log_3 x^2 - 2\log_x 9} = (x-1)^7$ is

Watch Video Solution

67. Find all real numbers x which satisty the equation. $2\log_2 \log_2 x + \log_{\frac{1}{2}} \log_2 (2\sqrt{2}x) = 1$

Watch Video Solution

68. $\log_{\frac{3}{4}} \log_8 (x^2+7) + \log_{\frac{1}{2}} \log_{\frac{1}{4}} (x^2+7)^{-1} = -2.$

Watch Video Solution

69. Prove that: `2(sqrt((log)_a4sqrt(a b)+(log)_b4sqrt(a b))-(log)_a4sqrt(2/b)+(log)_b4sqrt(a/b))dotsqrt((log)_a b)={2ifbgeqa >1 2^((log)_a bif1

Watch Video Solution

Exercise For Session 1

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

A. 6

B. 8

C. 3

D. 5

Answer: A

Watch Video Solution

2. The value of $\log_{\left(8-3\sqrt{7}\right)}\left(8+3\sqrt{7}\right)$ is

A. -2

B. -1

C. 0

D. Not defined

Answer: B

Watch Video Solution

3. The value of $(0.16)^{\log_{2.5}\left(\frac{1}{3}+\frac{1}{3^2}+\frac{1}{3^3}+\ldots.\text{to}\infty\right)}$, is

A. 2

B. 4

C. 6

D. 8

Answer: B

Watch Video Solution

4. If log2=0.301, the number of integers in the expansion of 4^{17} is

A. 9

B. 11

C. 13

D. 15

Answer: B

Watch Video Solution

5. If log2=0.301, the number of zeroes between the decimal point and the first significant figure of 2^{-34} is

A. 9

B. 10

C. 11

D. 12

Answer: B

Watch Video Solution

Exercise For Session 2

1. If $a = \log_{24} 12, b = \log_{36} 24, c = \log_{48} 36,$ then show that $1 + abc = 2bc$

A. 2ab

B. 2bc

C. 2ca

D. ba+bc

Answer: B

Watch Video Solution

2. The value of $\log_4[\,|\,\log_2\{\log_2(\log_3)81)\}]$ is equal to

A. -1

B. 0

C. 1

D. 2

Answer: B

Watch Video Solution

3. $\dfrac{\log_2 \log_2\left(\sqrt{\sqrt{\ldots\sqrt{\sqrt{2}}}}\right)}{nTimes}$ is equal to

A. 0

B. 1

C. n

D. $-n$

Answer: D

Watch Video Solution

4. If x =$\log_3(5)$ and y =$\log_{17}(25)$, which one of the following is correct?

A. $a < b$

B. a=b

C. $a > b$

D. None of these

Answer: C

Watch Video Solution

5. The value of $\log_{0.75}\log_2\sqrt{\sqrt[-2]{(0.125)}}$ is equal to

A. -1

B. 0

C. 1

D. None of these

Answer: C

Watch Video Solution

Exercise For Session 3

1. If $\log_{0.16}(a+1) < \log_{0.4}(a+1)$, then a satisfies

A. $a > 0$

B. $0 < a < 1$

C. $-1 < a < 0$

D. None of these

Answer: C

Watch Video Solution

2. The value of x satisfying the inequation $x^{\frac{1}{\log 10^x}} . \log_{10} x < 1$, is

A. $0 < x < 10$

B. $0 < x < 10^{10}$

C. $0 < x < 10^{1/10}$

D. None of these

Answer: C

Watch Video Solution

3. IF $\log_{\cos ecx} \sin x > 0$ then,

A. $x > 0$

B. $x < 0$

C. $-1 < x < 1$

D. None of these

Answer: D

Watch Video Solution

4. The value of $\log_{10} 3$ lies in the interval

A. $\left(\frac{2}{5}, \frac{1}{2}\right)$

B. $\left(0, \frac{1}{2}\right)$

C. $\left(0, \frac{2}{5}\right)$

D. None of these

Answer: A

Watch Video Solution

5. The least value of n in order that the sum of first n terms of the infinite series $1+\frac{3}{4}+\left(\frac{3}{4}\right)^2+\left(\frac{3}{4}\right)^3+\ldots$, should differ from the sum of the series by less than 10^{-6}, is $(given \log 2 = 0.30103, \log 3 = 0.47712)$

A. 14

B. 27

C. 53

D. 57

Answer: C

Watch Video Solution

Exercise Single Option Correct Type Questions

1. If $\log_{10} 2 = 0.3010\ldots,$ the number of digits in the number 2000^{2000} is

A. 6601

B. 6602

C. 6603

D. 6604

Answer: C

Watch Video Solution

2. There exists a positive number k such that $\log_2 x + \log_4 x + \log_8 x = \log_k x$, for all positive real no x. If k=$a^{\frac{1}{b}}$ where (a,b) ε N, the smallest possible value of (a+b)= (C) 12 A) 75 (B) 65 (D) 63_

A. 12

B. 63

C. 65

D. 75

Answer: D

Watch Video Solution

3. If $x_1, x_2 \& x_3$ are the three real solutions of the equation $x^{\log_{10}^2 x + \log_{10} x^3 + 3} = \dfrac{2}{\left(\frac{1}{\sqrt{x+1}-1} - \frac{1}{\sqrt{x+1}+1}\right)}$, where $x_1 > x_2 > x_3$, then

A. AP

B. GP

C. HP

D. $a^{-1} + b^{-1} = c^{-1}$

Answer: B

Watch Video Solution

4. If $f(n) = \prod_{i=2}^{n-1} \log_i(i+1)$, the value of $\sum_{k=1}^{100} f\left(2^k\right)$ equals

A. 5010

B. 5050

C. 5100

D. 5049

Answer: B

Watch Video Solution

5. If $\log_3 27. \log_x 7 = \log_{27} x. \log_7 3$, the least value of x is

A. 7^{-3}

B. 3^{-7}

C. 7^3

D. 3^7

Answer: A

Watch Video Solution

6. If $x = \log_5(1000)$ and $y = \log_7(2058)$,then

A. $x > y$

B. $x < y$

C. $x = y$

D. None of these

Answer: A

Watch Video Solution

7. Solve for x

$\log_5 120 + (x - 3) - 2 \cdot \log_5\left(1 - 5^{x-3}\right) = -\log_5\left(0.2 - 5^{x-4}\right)$

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

8. If $x_n > x_{n-1} > \ldots\ldots\ldots > x_3 > x_1 > 1.$ then the value of $\log_{x1}\left[\log_{x2}\left\{\log_{x3}\ldots\ldots\ldots\log_{x4}(x_n)^{x_{r=i}}\right\}\right]$

A. 0

B. 1

C. 2

D. undefined

Answer: B

Watch Video Solution

9. If $\frac{x(y+z-x)}{\log x} = \frac{y(z+x-y)}{\log y}\frac{z(x+y-z)}{\log z}, provethatx^y y^x = z^x y^z = x^z$

A. $z^x x^z$

B. $x^z y^x$

C. $x^y y^z$

D. $x^x y^y$

Answer: A

Watch Video Solution

10. If $y = a^{\frac{1}{1-\log_a x}}$, $z = a^{\frac{1}{1-\log_a y}}$ then prove that $x = a^{\frac{1}{1-\log_a z}}$

A. $a^{\frac{1}{1+\log_a z}}$

B. $a^{\frac{1}{2+\log_a z}}$

C. $a^{\frac{1}{1-\log_a z}}$

D. $a^{\frac{1}{2-\log_a z}}$

Answer: C

Watch Video Solution

11. If $(\log)_{0.3}(x-1) < (\log)_{0.09}(x-1)$, then x lies in the interval $(2, \infty)$ (b) $(1, 2)$ $(-2, -1)$ (d) None of these

A. $(-\infty.1)$

B. (1,2)

C. $(2, \infty)$

D. None of the above

Answer: C

Watch Video Solution

12. The value of $a^x - b^y$ is (where$x = \sqrt{\log_a b}$and $y = \sqrt{\log_b a}$, $a > 0$, $b > 0$ and $a, b \neq 1$)

A. 1

B. 2

C. 0

D. -1

Answer: C

View Text Solution

13. If $x = 1 + \log_a bc, y = 1 + \log_b ca, z = 1 + \log_c ab,$ then $\frac{xyz}{xy + yz + zx}$ is equal to

A. 0

B. 1

C. -1

D. 2

Answer: B

Watch Video Solution

14. The value of $a^{\frac{\log_b(\log_b x)}{\log_b a}}$, is

A. $\log_a N$

B. $\log_b N$

C. $\log_N a$

D. $\log_N b$

Answer: B

Watch Video Solution

15. Find the value of $49^{(1-\log_7(2))} + 5^{-\log_5(4)}$ is

A. 10.5

B. 11.5

C. 12.5

D. 13.5

Answer: C

Watch Video Solution

16. The number of real values of the parameter k for which the equation $(\log_{16}x)^2 - \log_{16}x + \log_{16}k = 0$ with real coefficients will have exactly one solution, is

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

17. The number of roots of the equation $x^{\log_x (x+3)^2} = 16$ is

A. 1

B. 0

C. 2

D. 4

Answer: B

Watch Video Solution

18. The point on the graph $y = \log_2 \log_6 \left\{2^{\sqrt{2x+1}} + 4\right\}$ whose y coordinate is 1 is

A. (1,1)

B. (6,1)

C. (8,1)

D. (12,1)

Answer: D

Watch Video Solution

19. Given ,log2=0.301 and log3=0.477, then the number of digits before decimal in $3^{12} \times 2^{8}$is

A. 7

B. 8

C. 9

D. 11

Answer: C

Watch Video Solution

20. The values of x, satisfying the equation for $\forall a > 0, 2\log_x a + \log_{ax} a + 3\log_{a^2 x} a = 0$ are

A. one

B. two

C. three

D. four

Answer: B

Watch Video Solution

Exercise More Than One Correct Option Type Questions

1. If $x^{(\log_2 x)^2 - 6\log_2 x + 11} = 64$ then x is equal to

A. 2

B. 4

C. 6

D. 8

Answer: A::B::D

Watch Video Solution

2. If $\log_{\lambda} x . \log_5 \lambda = \log_x 5, \lambda \neq 1, \lambda > 0$, then x is equal to

A. λ

B. 5

C. $\frac{1}{5}$

D. None of these

Answer: B::C

Watch Video Solution

3. If $S = \left\{x : \sqrt{\log_x \sqrt{3x}}\right.$, where $\log_3 x > -1\}$, then

A. S is a finite set

B. $S \notin \emptyset$

C. $S \subset (0, \infty)$

D. S properly contains $\left(\frac{1}{3}, \infty\right)$

Answer: C::D

Watch Video Solution

4. If x satisfies $\log_2(9^{x-1}+7) = 2 + \log_2(3^{x-1}+1)$, then

A. $x \notin Q$

B. $x \notin N$

C. $x \notin \{x \notin Q : x < 0\}$

D. $x \notin N_e$ (set of even natural number)

Answer: A::B

Watch Video Solution

5. $\log_p \log_p \underbrace{\sqrt[p]{\sqrt[p]{\sqrt[p]{\sqrt{\ldots\ldots \sqrt[p]{p}}}}}}_{\text{n times}}, \ p > 0$ and $p \neq 1$ is equal to

A. n

B. $-n$

C. $\dfrac{1}{n}$

D. $\log_{1/p}(p^n)$

Answer: B::D

Watch Video Solution

6. If $\log_a x = \alpha, \log_b x = \beta, \log_c x = \gamma$ and $\log_d x = \delta, x \neq 1$ and a,b,c, $d \neq 1$,then $\log_{abcd}$ x equals

A. $\leq \dfrac{\alpha+\beta+\gamma+\delta}{16}$

B. $\geq \dfrac{\alpha+\beta+\gamma+\delta}{16}$

C. $\dfrac{1}{\alpha^{-1}+\beta^{-1}+\gamma^{-1}+\delta^{-1}}$

D. $\frac{1}{\alpha\beta\gamma\delta}$

Answer: A::C

Watch Video Solution

7. If $\log_{10} 5 = a$ and $\log_{10} 3 = b$,then

A. $\log_{10} 8 = 3(1 - a)$

B. $\log_{40} 15 = \frac{(a + b)}{(3 - 2a)}$

C. $\log_{243} 32 = \left(\frac{1 - a}{b}\right)$

D. All of these

Answer: A::B::C::D

Watch Video Solution

8. If x is a positive real number different from 1 such that $\log_a x, \log_b x, \log_c x$ are in A.P then

A. $\log b = 2\frac{(\log a)(\log c)}{(\log a + \log c)}$

B. $b = \frac{a+c}{2}$

C. $b = \sqrt{a}c$

D. $c^2 = (ac)^{\log_a b}$

Answer: A::D

Watch Video Solution

9. If $|a| < |b|, b - a < 1$ and a, b are the real roots of the equation $x^2 - |\alpha|x - |\beta| = 0,$ then the equation $\log_{|b|}\left|\frac{x}{a}\right| - 1 = 0$ has

A. one root lying in interval $(-\infty, a)$

B. one root lying in interval (b, ∞)

C. one positive root

D.

Answer: C::D

Watch Video Solution

Exercise Passage Based Questions

1. Let $\log_2 N = a_1 + b_1, \log_3 N = a^2 + b^2$ and $\log_5 N = a_3 + b_3,$ where $a_1, a_2, a_3 \notin 1$ and $b_1, b_2 b_3 \notin [0, 1]$.

If $a_1 = 5 \text{ and } a_2 = 3$, the number of integral values of N is

A. 16

B. 32

C. 48

D. 64

Answer: B

View Text Solution

View Text Solution

2. Let $\log_2 N = a_1 + b_1$, $\log_3 N = a_2 + b_2$ and $\log_5 N = a_3 + b_3$, where $a_1, a_2, a_3 \notin 1$ and $b_1, b_2 b_3 \in [0, 1)$.

If $a_1 = 6, a_2 = 4$ and $a_3 = 3$,the difference of largest and smallest integral values of N, is

A. 124

B. 63

C. 624

D. 127

Answer: D

Watch Video Solution

3. Let $\log_2 N = a_1 + b_1$, $\log_3 N = a_2 + b_2$ and $\log_5 N = a_3 + b_3$, where $a_1, a_2, a_3 \notin 1$ and $b_1, b_2 b_3 \notin [0, 1)$.

If $a_1 = 6, a_2 = 4$ and $a_3 = 3$,the difference of largest and smallest integral values of N, is

A. 2

B. 8

C. 14

D. 20

Answer: A

Watch Video Solution

4. Let S denotes the antilog of 0.5 to the base 256 and K denotes the number of digits in 6^{10} (given $\log_{10} 2 = 0.301$,$\log_{10} 3 = 0.477$) and G denotes the number of positive integers, which have the characteristic 2, when the base of logarithm is 3.

The value of SKG is

A. 18

B. 24

C. 30

D. 36

Answer: A

Watch Video Solution

5. Let S denotes the antilog of 0.5 to the base 256 and K denotes the number of digits in 6^{10} (given $\log_{10} 2 = 0.301, \log_{10} 3 = 0.477$) and G denotes the number of positive integers, which have the characteristic 2, when the base of logarithm is 3.

The value of SKG is

A. 72

B. 144

C. 216

D. 288

Answer: B

Watch Video Solution

6. Let S denotes the antilog of 0.5 to the base 256 and K denotes the number of digits in 6^{10} (given $\log_{10} 2 = 0.301$,$\log_{10} 3 = 0.477$) and G denotes the number of positive integers, which have the characteristic 2, when the base of logarithm is 3.

The value of SKG is

A. 1440

B. 17280

C. 2016

D. 2304

Answer: D

Watch Video Solution

7. Suppose U denotes the number of digits in the number $(60)^{100}$ and M denotes the number of cyphers after decimal, before a significant figure comes in $(8)^{-296}$. If the fraction U/M is expressed as rational number in the lowest term as p/q (given $\log_{10} 2 = 0.301$ and $\log_{10} 3 = 0.477$) .

The value of p is

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

8. Suppose U denotes the number of digits in the number $(60)^{100}$ and M denotes the number of cyphers after decimal, before a significant figure comes in $(8)^{-296}$. If the fraction U/M is expressed as rational number in the lowest term as p/q (given $\log_{10} 2 = 0.301$ and $\log_{10} 3 = 0.477$) .

The value of q is

A. 5

B. 2

C. 3

D. 4

Answer: C

Watch Video Solution

9. Suppose U denotes the number of digits in the number $(60)^{100}$ and M denotes the number of cyphers after decimal, before a significant figure comes in $(8)^{-296}$. If the fraction U/M is expressed as rational number in the lowest term as p/q (given $\log_{10} 2 = 0.301$ and $\log_{10} 3 = 0.477$) .

The equation whose roots are p and q, is

A. $x^2 - 3x + 2 = 0$

B. $x^2 - 5x + 6 = 0$

C. $x^2 - 7x + 12 = 0$

D. $x^2 - 9x + 20 = 0$

Answer: B

Watch Video Solution

10. Let G,O,E and L be positive real numbers such that log(G.L)+log(G.E)=3,log(E.L)+log(E.O)=4, log(O.G)+log(O.L)=5 (base of the log is 10)

If the value of the product (GOEL) is λ, the value of $\sqrt{\log\lambda\sqrt{\log\lambda\sqrt{\log\lambda....}}}$ is

A. 3

B. 4

C. 5

D. 7

Answer: B

View Text Solution

11. Let G,O,E and L be positive real numbers such that log(G.L)+log(G.E)=3,log(E.L)+log(E.O)=4, log(O.G)+log(O.L)=5 (base of the log is 10)

If the minimum value of 3G+2L+2O+E is $2^{\lambda}3^{\mu}5^{\nu}$,Where λ, μ,and ν are whole numbers, the value of $\sum(\lambda^{\mu}+\mu^{\nu})$ is

A. 7

B. 13

C. 19

D. None of these

Answer: A

View Text Solution

12. Let G,O,E and L be positive real numbers such that log(G.L)+log(G.E)=3,log(E.L)+log(E.O)=4, log(O.G)+log(O.L)=5 (base of the log is 10)

If $\log\left(\frac{G}{O}\right)$ and $\log\left(\frac{O}{E}\right)$ are the roots of the equation

A. $x^2 + x = 0$

B. $x^2 - x = 0$

C. $x^2 - 2x + 3 = 0$

D. $x^2 - 1 = 0$

Answer: D

Watch Video Solution

Exercise Single Integer Answer Type Questions

1. If $x, y \in R^+$ and $\log_{10}(2x) + \log_{10} y = 2$, $\log_{10} x^2 - \log_{10}(2y) = 4$ and $x + y = \frac{m}{n}$,Where m and n are relative prime , the value of $m - 3n^6$ is

Watch Video Solution

2. A line $x = \lambda$ intersects the graph of $y = \log_5 x$ and $y = \log_5(x+4)$ .The distance between the point of intersection is 0.5. Given $\lambda = a + \sqrt{b}$,where a and b are integers , the value of (a+b) is

Watch Video Solution

3. If the left hand side of the equation

$a(b-c)x^2 + b(c-a)xy + c(a-b)y^2 = 0$ is a perfect square , the value of

$$\left\{\frac{\log(a+c) + \log(a-2b+c)^2}{\log(a-c)}\right\}^2, (a, b, c \in R^+, a > c) \text{ is}$$

Watch Video Solution

4. Number of integers satisfying the inequality

$$\left(\frac{1}{3}\right)^{\frac{|x+2|}{2-|x|}} < 9 \text{ is}$$

Watch Video Solution

5. If $x > 2$ is a solution of the equation

$\left|\log_{\sqrt{3}} x - 2\right| + \left|\log_3 x - 2\right| = 2$, then the value of x is

Watch Video Solution

6. Number of integers satisfying the inequality

$\log_2 \sqrt{x} - 2\log^2_{1/4} x + 1 > 0$,is

View Text Solution

7. The values of b for which the equation

$2\log_{\frac{1}{25}}(bx + 28) = 1\log_5\left(12 - 4x - x^2\right)$ has coincident roots is/are

Watch Video Solution

8. The value of $\dfrac{2^{\log_{\frac{1}{2}4}2} - 3^{\log_{27}125} - 4}{\left(7^{4\log_{49}2}\right) - 3}$ is

Watch Video Solution

9. If x_1 and x_2 $(x_2 > x_1)$ are the integral solutions of the equation $(\log_5 x)^2 + \log_{5x}\left(\dfrac{5}{x}\right) = 1,$, the value of $|x_2 - 4x_1|$ is

View Text Solution

10. If $x = \log_\lambda a = \log_a b = \dfrac{1}{2}\log_b c$ and $\log_\lambda c = nx^{n+1}$, the value of n is

Watch Video Solution

Exercise Matching Type Questions

1. Match the following Column I and Column II

	Column I		Column II
(A)	$\dfrac{\log_3 243}{\log_2 \sqrt{32}}$	(p)	positive integer
(B)	$\dfrac{2 \log 6}{(\log 12 + \log 3)}$	(q)	negative integer
(C)	$\log_{1/3}\left(\dfrac{1}{9}\right)^{-2}$	(r)	rational but not integer
(D)	$\dfrac{\log_5 16 - \log_5 4}{\log_5 128}$	(s)	prime

Watch Video Solution

2. Match the following Column I and Column II

	Column I		Column II
(A)	If $\log_{1/x}\left\{\frac{2(x-2)}{(x+1)(x-5)}\right\} \geq 1$, then x can belongs to	(p)	$\left(0, \frac{1}{3}\right]$
(B)	If $\log_3 x - \log_3^2 x \leq \frac{3}{2}\log_{(1/2\sqrt{2})} 4$, then x can belongs to	(q)	$(1, 2]$
(C)	If $\log_{1/2}(4-x) \geq \log_{1/2}2 - \log_{1/2}(x-1)$, then x belongs to	(r)	$[3, 4)$
(D)	Let α and β are the roots of the quadratic equation $(\lambda^2 - 3\lambda + 4)x^2 - 4(2\lambda - 1)x + 16 = 0$, if α and β satisfy the condition $\beta > 1 > \alpha$, then p can lie in	(s)	$(3, 8)$

Watch Video Solution

Exercise Statement I And Ii Type Questions

1. Statement-1(Assertion) and Statement-2 (reason) Each of these question also has four alternative choices, only one of which is the correct answer. You have to select the correct choice as given below.

(a) Statement-1 is true, Statement-2 is true, Statement-2 is a correct explanation for Statement-1

Statement-1 is true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -1

(c) Statement -1 is true, Statement -2 is false

(d) Statement -1 is false, Statement -2 is true

Statement -1 $\log_{10} x < \log_3 x < \log_e x < \log_2 x \ (x > 0, x \neq 1)$

Statment If $0 < x < 1$, then $\log_x a > \log_x b \Rightarrow 0 < a < b$.

Watch Video Solution

2. Statement-1(Assertion) and Statement-2 (reason) Each of these question also has four alternative choices, only one of which is the correct answer. You have to select the correct choice as given below.

(a) Statement-1 is true, Statement-2 is true, Statement-2 is a correct explanation for Statement-1

Statement-1 is true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -1

(c) Statement -1 is true, Statement -2 is false

(d) Statement -1 is false, Statement -2 is true

Statement -1 The equation $7^{\log_7(x^3+1)} - x^2 = 1$ has two distinct real roots .

Statement -2 $a^{\log_a N} = N$, where $a > 0, a \neq 1$ and $N > 0$

Watch Video Solution

3. Statement -1 $\left(\frac{1}{2}\right)^7 < \left(\frac{1}{3}\right)^4$

$\Rightarrow 7\log\left(\frac{1}{2}\right) < 4\log\left(\frac{1}{3}\right) \Rightarrow 7 < 4$

Statement-2 If $ax < ay$, where $a < 0$,x,$y > 0$, then $x > y$.

(a) Statement-1 is true, Statement-2 is true, Statement-2 is a correct explanation for Statement-1

Statement-1 is true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -1

(c) Statement -1 is true, Statement -2 is false

(d) Statement -1 is false, Statement -2 is true.

Watch Video Solution

4. Statement-1(Assertion) and Statement-2 (reason) Each of these question also has four alternative choices, only one of which is the correct answer. You have to select the correct choice as given below.

(a) Statement-1 is true, Statement-2 is true, Statement-2 is a correct explanation for Statement-1

Statement-1 is true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -1

(c) Statement -1 is true, Statement -2 is false

(d) Statement -1 is false, Statement -2 is true

Statement -1 The equation $x^{\log_x (1-x)^2} = 9$ has two distinct real solutions.

Statement -2$a^{\log_a b} = b$, when $a < 0, a \neq 1, b > 0.$

Watch Video Solution

5. Statement-1(Assertion) and Statement-2 (reason) Each of these question also has four alternative choices, only one of which is the correct answer. You have to select the correct choice as given below.

(a) Statement-1 is true, Statement-2 is true, Statement-2 is a correct explanation for Statement-1

Statement-1 is true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -1

(c) Statement -1 is true, Statement -2 is false

(d) Statement -1 is false, Statement -2 is true

Statement -1 The equation $(\log x)^2 + \log x^2 - 3 = 0$ has two distinct solutions.

Statement-2 $\log x^2$=2logx.

Watch Video Solution

6. Statement-1(Assertion) and Statement-2 (reason) Each of these question also has four alternative choices, only one of which is the correct answer. You have to select the correct choice as given below.

(a) Statement-1 is true, Statement-2 is true, Statement-2 is a correct explanation for Statement-1

Statement-1 is true, Statement-2 is true, Statement-2 is not a correct explanation for Statement -1

(c) Statement -1 is true, Statement -2 is false

(d) Statement -1 is false, Statement -2 is true

Statement -1 $\log_x 3 . \log_{x/9} 3 = \log_{81}(3)$ has a solution.

Statement-2 Change of base in logarithms is possible .

Watch Video Solution

Exercise Subjective Type Questions

1. If $\log_7 12 = a$, $\log_{12} 24 = b$, then find value of $\log_{54} 168$ in terms of a and b.

View Text Solution

2. If $\log_3 4 = a, \log_5 3 = b$, then find the value of $\log_3 10$ in terms of a and b.

Watch Video Solution

3. If $\frac{Ina}{b-c} = \frac{Inb}{c-a} = \frac{Inc}{a-b}$, prove the following .

abc=1

Watch Video Solution

4. If $\frac{Ina}{b-c} = \frac{Inb}{c-a} = \frac{Inc}{a-b}$, prove the following .

$a^a.\,b^b.\,c^c = 1$

Watch Video Solution

5. If $\frac{Ina}{b-c} = \frac{Inb}{c-a} = \frac{Inc}{a-b}$, prove the following .

$a^{b^2+bc+c^2}.\,b^{c^2+ca+a^2}.\,c^{a^2+ab+b^2} = 1$

Watch Video Solution

6. If $\frac{Ina}{b-c} = \frac{Inb}{c-a} = \frac{Inc}{a-b}$, prove the following .

$a+b+c \geq 3$

Watch Video Solution

7. If $\frac{Ina}{b-c}=\frac{Inb}{c-a}=\frac{Inc}{a-b}$, prove the following .

$a^a+b^b+c^c\geq 3$

Watch Video Solution

8. If $\frac{Ina}{b-c}=\frac{Inb}{c-a}=\frac{Inc}{a-b}$, prove the following .

$a^{b^2+bc+c^2}.\,b^{c^2+ca+a^2}.\,c^{a^2+ab+b^2}=1$

Watch Video Solution

9. Prove that $\log_{10}2$ lies between $\frac{1}{4}$ and $\frac{1}{3}$.

Watch Video Solution

10. If log2=0.301 and log3=0.477, find the number of integers in 5^{200}

Watch Video Solution

11. If log2=0.301 and log3=0.477, find the number of integers in 6^{20}

Watch Video Solution

12. If log2=0.301 and log3=0.477, find the number of integers in the number of zeroes after the decimal is 3^{-500}.

Watch Video Solution

13. If log2=0.301 and log3=0.477, find the value of log(3.375).

Watch Video Solution

14. Find the least value of $\log_2 x - \log_x(0.125)$ for $x > 1$.

Watch Video Solution

15. Find values of lamda for which $\frac{1}{\log_3 \lambda} + \frac{1}{\log_4 \lambda} > 2$.

Watch Video Solution

16. Solve the following equations.

(i) $x^{1+\log_{10} x} = 10x$

Watch Video Solution

17. Solve the following equations.

(ii)$\log_2(9 + 2^x) = 3$

Watch Video Solution

18. Solve the following equations.

(iii) $2.\ x^{\log_4 3} + 3^{\log_4 x} = 27$

Watch Video Solution

19. Solve the following equations.

(iv) $\log_4 \log_3 \log_2 x = 0$

Watch Video Solution

20. Solve the following equations.

(v) $x^{\frac{\log_{10} x + 5}{3}} = 10^{5 + \log_{10} x}$

Watch Video Solution

21. Solve the following equations.

(vi) $\log_3\left(\log_9 x + \frac{1}{2} + 9^x\right) = 2x$

Watch Video Solution

22. Solve the following equations.

(vii) $4^{\log_{10} x + 1} - 6^{\log_{10} x} - 2.3^{\log_{10} x^2 + 2} = 0$

Watch Video Solution

23. Solve the following equations.

(viii) $\dfrac{\log 10(x-3)}{\log_{10}(x^2-21)} = \dfrac{1}{2}$

Watch Video Solution

24. Solve the following equations. $x^{\log_2 x + 4} = 32$

Watch Video Solution

25. Solve the following equations.

(x) $\log_a x = x$, where $a = x^{\log_a x}$

Watch Video Solution

26. Solve the following equations.

(xi) $\log_{\sqrt{2}\sin x}(1+\cos x)=2$

Watch Video Solution

27. A rational number which is 50 times its own logarithm to the base 10, is

Watch Video Solution

28. $\left[\frac{2}{\log_4(2000)^6}+\frac{3}{\log_5(2000)^6}\right]$

Watch Video Solution

29. Find the value of x satisfying

$\log_a\{1+\log_b\{1+\log_c(1+\log_p x)\}\}=0.$

Watch Video Solution

30. Find the value of $4^{5\log_{4\sqrt{2}}\left(3-\sqrt{6}\right)-6\log_{8}\left(\sqrt{3}-\sqrt{2}\right)}$.

Watch Video Solution

31. Solve the following inequation .

(i) $\log_{(2x+3)} x^2 < 1$

Watch Video Solution

32. Solve the following inequation .

(ii) $\log_{2x}\left(x^2-5x+6\right) < 1$

Watch Video Solution

33. Solve the following inequation .

(iii) $\log_2(2-x) < \log_{1/2}(x+1)$

Watch Video Solution

34. Solve the following inequation .

(iv) $\log_{x^2}(x+2) < 1$

Watch Video Solution

35. Solve the following inequation .

(v) $3^{\log_3 \sqrt{(x-1)}} < 3^{\log_3 (x-6)} + 3$

Watch Video Solution

36. Solve the following inequation .

(vi) $\log_{1/2}(3x-1)^2 < \log_{1/2}(x+5)^2$

Watch Video Solution

37. Solve the following inequation .

(vii) $\log_{10} x + 2 \leq \log_{10}^2 x$

Watch Video Solution

38. Solve the following inequation .

(viii) $\log_{10}\left(x^2 - 2x - 2\right) \leq 0$

Watch Video Solution

39. Solve the following inequation .

(ix) $\log x\left(2x - \frac{3}{4}\right) > 2$

Watch Video Solution

40. Solve the following inequation . $\log_{1/3}x < \log_{1/2}x$

Watch Video Solution

41. Solve the inequation $\log_{2x+3}x^2 < \log_{2x+3}(2x+3)$

Watch Video Solution

42. Solve the following inequation .

(xii) $\log_2^2 x + 3\log_2 x \geq \frac{5}{2}\log_{4\sqrt{2}}16$

Watch Video Solution

43. Solve the following inequation .

(xiii) $(x^2 + x + 1)^x < 1$

Watch Video Solution

44. Solve the following inequation .

(xiv) $\log_{(3x^2+1)} 2 < \frac{1}{2}$

Watch Video Solution

45. Solve the following inequation .

(xv) $x^{(\log_{10} x)^2 - 3\log_{10} x + 1} > 1000$

Watch Video Solution

46. Solve the following inequation .

(xvi) $\log_4 \{14 + \log_6 (x^2 - 64)\} \le 2$

Watch Video Solution

47. Solve the following inequation .

(xvii) $\log_2 (9 - 2^x) \le 10^{\log_{10}(3-x)}$

Watch Video Solution

Watch Video Solution

48. Solve the following inequation .

(xviii) $\log_a\left(\frac{2x+3}{x}\right) \geq 0$ for (a) $a > 1$,(b) $0 < a < 1$

Watch Video Solution

49. Solve the following inequation .

(xix) $1 + \log_2(x-1) \leq \log_{x-1} 4$

Watch Video Solution

50. Solve the following inequation .

(xx) $\log_{5x+4} x^2 \leq \log_{5x+4}(2x+3)$

View Text Solution

51. Solve $\sqrt{\log_x (ax)^{\frac{1}{5}} + \log_a (ax)^{\frac{1}{5}}} + \sqrt{\log_a \left(\frac{x}{a}\right)^{\frac{1}{5}} + \log_x \left(\frac{a}{x}\right)^{\frac{1}{5}}} = a$

Watch Video Solution

52. It is known that x=9 is root of the equation. $\log_\lambda (x^2 + 15a^2) - \log_\lambda (a - 2) = \log_\lambda \frac{8ax}{a - 2}$ find the other roots of this equation.

Watch Video Solution

53. Solve $\log_4(\log_3 x) + \log_{1/4}(\log_{1/3} y) = 0$ and $x^2 + y^2 = \frac{17}{4}$.

Watch Video Solution

54. Find the real values (s) of x satisfying the equation $\log_{2x}(4x) + \log_{4x}(16x) = 4.$

Watch Video Solution

55. Find the sum and product of all possible values of x which makes the following statement true.

$\log_6 54 + \log_x 16 = \log_{\sqrt{2}} x - \log_{36}\left(\frac{4}{9}\right)$.

Watch Video Solution

56. Solve : $\frac{3}{2}\log_4 (x+2)^2 + 3 = \log_4 (4-x)^3 + \log_4 (6+x)^3$.

Watch Video Solution

57. Solve $\log_2\left(4^{x+1}+4\right).\log_2\left(4^x+1\right) = \log_{1/\sqrt{2}}\left(\frac{1}{\sqrt{8}}\right)$.

Watch Video Solution

58. Solve the system of equation $2^{\sqrt{x}+\sqrt{y}} = 256$ and $\log_{10}\sqrt{xy} - \log_{10}\left(\frac{3}{2}\right) = 1$.

Watch Video Solution

59. Solve the system of equations $\log_2 y = \log_4(xy - 2), \log_9 x^2 + \log_3(x - y) = 1.$

Watch Video Solution

60. Find the solution of the inequality $2\log_{\frac{1}{4}}(x+5) > \frac{9}{4}\log_{\frac{1}{3\sqrt{3}}}(9) + \log_{\sqrt{x+5}}(2)$

Watch Video Solution

61. Solve $\log_3\left(\sqrt{x} + |\sqrt{x} - 1|\right) = \log_9\left(4\sqrt{x} - 3 + 4|\sqrt{x} - 1|\right).$

Watch Video Solution

62. In the equality

$$(\log_2 x)^4 - \left(\log_{1/2}\frac{x^5}{4}\right)^2 - 20\log_2 x + 148 < 0$$

holds true in (a,b), where a,b $\in$ N. Find the value of ab (a+b).

Watch Video Solution

63. Find the value of x satisfying the equation,

$$\sqrt{\left(\log_3(3x)^{\frac{1}{3}} + \log_x(3x)^{\frac{1}{3}}\right)\log_3\left(x^3\right)} + \sqrt{\left(\log_3\left(\frac{x}{3}\right)^{\frac{1}{3}} + \log_x\left(\frac{3}{x}\right)^{\frac{1}{3}}\right)\log$$

Watch Video Solution

64. If P is the number of natural numbers whose logarithms to the base 10 have the characteristic $pandQ$ is the number of natural numbers logarithms of whose reciprocals to the base 10 have the characteristic $-q$, then find the value of $\log_{10}P - (\log)_{10}Q$.

Watch Video Solution

Exercise Questions Asked In Previous 13 Years Exam

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

A. 0

B. 1

C. 2

D. 3

Answer: B

Watch Video Solution

2. Let (x_0, y_0) be the solution of the following equations

$(2x)^{In2} = (3y)^{In3}\ 3^{Inx} = 2^{Iny}$, then x_0 is

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{1}{2}$

D. 6

Answer: C

Watch Video Solution

3. The value of

$$6 + \log_{3/2}\left(\frac{1}{3\sqrt{2}}\sqrt{4 - \frac{1}{3\sqrt{2}}\sqrt{4 - \frac{1}{3\sqrt{2}}\sqrt{4 - \frac{1}{3\sqrt{2}}\ldots}}}\right)$$ is

Watch Video Solution

4. If $3^x = 4^{x-1}$, then x equals

A. $\frac{2\log_3 2}{2\log_3 2 - 1}$

B. $\frac{2}{2 - \log_2 3}$

C. $\dfrac{1}{1-\log_4 3}$

D. $\dfrac{2\log_2 3}{2\log_2 3-1}$

Answer: A::B::C

Watch Video Solution