MATHS

BOOKS - KC SINHA MATHS (HINGLISH)

LOGARITHM - FOR BOARDS

Solved Examples

1. Find the value of b satisfying $\log_{\sqrt{8}} b = 3\frac{1}{3}$

Watch Video Solution

2. 10 Find the value of $\log_b a.\ \log_c b.\ \log_a c.$

Watch Video Solution

3. Prove that: $\log_3 \log_2 \log_{\sqrt{5}}(625) = 1$

Watch Video Solution

4. If $a^2 + b^2 = 23ab$, then prove that: $\frac{\log(a+b)}{5} = \frac{1}{2}(\log a + \log b)$

Watch Video Solution

5. Find the value of log $\tan 1^0 \log \tan 2^0 \log \tan 89^0$

Watch Video Solution

6. Simplify: $2^{(\log)_3 5} - 5^{(\log)_3 2}$

Watch Video Solution

7. If $\frac{\log x}{y-z} = \frac{\log y}{z-x} = \frac{\log z}{x-y}$, then prove that: $x^x y^y z^z = 1$

Watch Video Solution

8. The value of $(yz)^{\log y - \log z} \times (zx)^{\log z - \log x} \times (xy)^{\log x - \log y}$ is

Watch Video Solution

9. Prove that:

$$\frac{1}{\log_2 N} + \frac{1}{\log_3 N} + \frac{1}{nog_4 N} + \ldots + \frac{1}{\log_{2011} N} = \frac{1}{\log_{2011} N}$$

Watch Video Solution

10. If $0 < x < 1$, prove that:

$$\log(1+x) + \log\left(1+x^2\right) + \log\left(1+x^4\right) + \ldots\infty = -\log(1-x)$$

Watch Video Solution

11. If a,b,c, be the pth,qth nd rth terms respectively of a Geometric progression, and a, $b, c > 0$ then show that: $(q-r)\log a + (r-p)\log b + (p-q)\log c = 0$

Watch Video Solution

12. If a,b,c are in G.P., prove that: $\log_a x, \log_b x, \log_c x$are in H.P.

Watch Video Solution

13. If $(\log)_7(\log)_5\left(\sqrt{x+5}+\sqrt{x}\right) = 0,$ what is the value o x? 3 b. 4 c. 2 d. 5

Watch Video Solution

14. If $\log_5\left(5^{\frac{1}{x}}+125\right) = \log_5 6 + 1 + \frac{1}{2x}$, then x =

Watch Video Solution

15. if $\frac{1+3+5-...up \to nterms}{4+7+10+...up \to nterms} = \frac{20}{7\log_{10} X}$ and $n = \log_{10} x + \frac{\log_{10} X^1}{2} + \frac{\log_{10} X^1}{4} + ... + \infty$, then x is equal to

Watch Video Solution

16. If $4^{\log_9(3)} + 9^{\log_2(4)} = 10^{\log_x(83)}$ then x =

Watch Video Solution

17. If $4^{\log_9(3)} + 9^{\log_2(4)} = 10^{\log_x(83)}$ then x =

Watch Video Solution

18. If $\frac{6}{5}a^A - 3^B = 9^C$ where $A = \log_a x. \log_{10} a \log_a 5$, $B = \log_{10}\left(\frac{x}{10}\right)$ and $C = \log_{100} x + \log_4 2$. Find x

Watch Video Solution

19. Solve for $x: \left(5+2\sqrt{6}\right)^{x}$ ^ $(2-3)+\left(5-2\sqrt{6}\right)^{x}$ ^ $(2-3)=10.$

Watch Video Solution

20. solve for x: $2\log_{10} x - \log_{x}(0.01) = 5$

Watch Video Solution

21. For what values of x, $\log_{0.3}\left(x^{2}+8\right) > \log_{0.3}(9x)$

Watch Video Solution

22. Solve the inequality: $\log_{x-2}(2x-3) > \log_{x-2}(24-6x)$

Watch Video Solution

23. Show that: $\log_{10} 2$ lies between $\frac{1}{3}$ and $\frac{1}{4}$

Watch Video Solution

24. Which one is greater: $\cos(\log_e \theta)$ or $\log_e(\cos\theta)$ if $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$

Watch Video Solution

25. If $\log_2 x + \log_2 y \geq 6$prove that the smallest possible value of x+y is 16.

Watch Video Solution

Exercise

1. $\log_9 \tan\left(\frac{\pi}{6}\right)$

Watch Video Solution

2. Evaluate: $\log_{a^2} b \div \log_{\sqrt{a}} (b)^2$

Watch Video Solution

3. Evaluate: $\log_{\sqrt{5}} .008$

Watch Video Solution

4. Evaluate: $\log_{2\sqrt{3}} 144$

Watch Video Solution

5. Prove that $\log_2 \log_2 \log_{\sqrt{3}} 81 = 1$

Watch Video Solution

6. Prove that: $\log_a x \times \log_b y = \log_b x \times \log_a y$

Watch Video Solution

7. Prove that (i) $\log_2 \log_2 \log_2 16 = 1$

Watch Video Solution

8. Prove that: $\log_a x = \log_b x \times \log_c b \times \ldots \times \log_n m \times \log_a n$

Watch Video Solution

9. Prove that: $a^x = 10^{x \log_{10} a}$

Watch Video Solution

10. If $a^2 + b^2 = 7ab$ prove that $\left(\frac{\log(a+b)}{3}\right) = \frac{\log a + \log b}{2}$

Watch Video Solution

11. Prove that: $\frac{\log_a(\log_b a)}{\log_b(\log_a b)} = -\log_a b$

Watch Video Solution

12. Prove that $\log(1+2+3) = \log 1 + \log 2 + \log 3$

Watch Video Solution

13. Prove that:

$2\log(1+2+4+7+14) = \log 1 + \log 2 + \log 4 + \log 7 + \log 14$

Watch Video Solution

14. prove that $\log 2 + 16\log\left(\frac{16}{15}\right) + 12\log\left(\frac{25}{24}\right) + 7\log\left(\frac{81}{80}\right) = 1$

Watch Video Solution

15. Prove that: $\frac{\log_9 11}{\log_5 3} = \frac{\log_3 11}{\log_{\sqrt{5}} 3}$.

Watch Video Solution

16. If $\log_{10} 343 = 2.5353$ then the least positive integer 'n' such that $7^n > 10^5$ is

Watch Video Solution

17. If a,b,c are in G.P., prove that: $\log_a x, \log Pbx, \log_c x$are in H.P.

Watch Video Solution

18. Prove that: $\log \sin 8x = 3\log 2 + \log \sin x + \log \cos 2x + \log \cos 4x$

Watch Video Solution

19. If $\log_4 10 = x, \log_2 20 = y$ and $\log_5 8 = z$.prove that $\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1} = 1.$

Watch Video Solution

20. if $x = \log_a(bc), y = \log_b(ca)$ and $z = \log_c(ab)$ then $\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1}$

Watch Video Solution

21. $\frac{1}{1+\log_b a + \log_b c} + \frac{1}{1+\log_c a + \log_c b} + \frac{1}{1+\log_a b + \log_a c}$

Watch Video Solution

22. prove that $x^{\log y - \log z} . y^{\log z - \log x} . z^{\log x - \log y} = 1$

Watch Video Solution

23. $\frac{\log a}{y-z} = \frac{\log b}{z-x} = \frac{\log c}{x-y}, then a^x b^y c^z$ is equal to

Watch Video Solution

24. If $x\frac{y+z-x}{\log x} = y\frac{z+x-y}{\log y} = z\frac{x+y-z}{\log z}$; Prove that $x^y y^x = z^y y^z = x^z z^x$

Watch Video Solution

25. If $\frac{\log a}{b-c} = \frac{\log b}{c-a} = \frac{\log c}{a-b}$, then $a^{b+c}.\ b^{c+a}.\ c^{a+b}$=

Watch Video Solution

26. If $\frac{\log x}{q-r} = \frac{\log y}{r-p} = \frac{\log z}{p-q}$ prove that $x^{q+r}.\ y^{r+p}.\ z^{p+q} = x^p.\ y^q.\ z^r$

Watch Video Solution

27. Show that: $\frac{1}{\log_2 n}+\frac{1}{\log_3 n}+\frac{1}{\log_4 n}+\ldots+\frac{1}{\log_{43} n}=\frac{1}{\log_{43!} n}$

Watch Video Solution

28. $2\left(\log a+\log a^2+\log a^3+\log a^4+\ldots\ldots\ldots\ldots\ldots+\log a^n\right)$ is equal to

Watch Video Solution

29. How many zeroes are there between the decimal point and first significasnt digits in $(0.0504)^{10}$. Given $\log 2=0.301, \log 3=0.477 nd \log 7=0.845$

Watch Video Solution

30. Find the number of digits in $(72)^{15}$ without actual computation. Given $\log 2=0.301, \log 3=0.477$.

Watch Video Solution

31. How many positive integers have characteristics 2 when base is 5.

Watch Video Solution

32. If $\log 2 = 0.301$ and $\log 3 = 0.477$, find the number of digits in: $(3^{15} \times 2^{10})$

Watch Video Solution

33. If $\log 2 = 0.\ 30101,\ \log 3 = 0.\ 47712,$ then the number of digits in 6^{20} is 15 b. 16 c. 17 d. 18

Watch Video Solution

34. Find the number of digits 5^{25}

Watch Video Solution

35. Solve the equation: $\log_2 x + \log_4(x+2) = 2$

Watch Video Solution

36. $\log_X(X+2) + \log_{X+2} X = \frac{5}{2}$

Watch Video Solution

37. Solve the equation: $\frac{\log(x+1)}{\log x} = 2$

Watch Video Solution

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

Watch Video Solution

39. if $x + \log_{10}(1 + 2^x) = x \log_{10} 5 + \log_{10} 6$ then x

Watch Video Solution

40. The equation $x^{\frac{3}{4}(\log_2(x)) - \left(\frac{5}{4}\right)} = \sqrt{2}$ has

Watch Video Solution

41. The number $\log_{20} 3$ lies in

Watch Video Solution

42. Show that: $\log_{493}$ lies between $\frac{1}{3}$ and $\frac{1}{4}$

Watch Video Solution

43. Find the values of x satisfying the inequalities : $\log_{0.1}(4x^2 - 1) > \log_{0.1} 3x$

Watch Video Solution

44. Find the values of x satisfying the inequalities : $\log_2(x^2 - 24) > \log_2(5x)$`

Watch Video Solution

45. The value of $\frac{1}{\log_3 \pi} + \frac{1}{\log_4 \pi}$ is

Watch Video Solution

46. For what value of x $\log_3(x^2 + 10) > \log_3(7x)$

Watch Video Solution

47. Solve the inequality : $x^{\log x} > 10.$

Watch Video Solution

48. $\log_x 2.\ \log_{2x} 2\log_2(4x) > 1$

Watch Video Solution

49. If $\log_{30} 3 = x, \log_{30} 5 = y, then \log_{30} 8 =$

Watch Video Solution

50. If $\log_{12} 18 = \alpha$ and $\log_{24} 54 = \beta$. Prove that $\alpha\beta + 5(\alpha - \beta) = 1$

Watch Video Solution

51. If a,b,c are in G.P., prove that: $\log_a x, \log Pbx, \log_c x$are in H.P.

Watch Video Solution

52. If $\log_a x, \log_b x, \log_c x$ are in A.P then $c^2 =$

Watch Video Solution

53. If a, b, c are distinct positive real numbers each different from unity such that $(\log_a a.\log_c a - \log_a a) + (\log_a b.\log_c b - \log b_b) + (\log_a c.\log_a c - \log_c c) =$ then prove that $abc = 1$.

Watch Video Solution

54. If $\log_3(2), \log_3(2^x - 5), \log_3\left(2^x - \frac{7}{2}\right)$ are in A.P. Determine the value of x.

Watch Video Solution

55. If $a \neq 0$ and $\log_x(a^2+1) < 0$ then x lies in the interval (A) $(0, \infty)$ (B) $(0, 1)$ (C) $(0, a)$ (D) none of these

Watch Video Solution

56. The number $(\log)_2 7$ is (1990, 2M) an integer (b) a rational number an irrational number (d) a prime number

Watch Video Solution

57. If $\log_{0.5}(x-2) < \log_{0.25}(x-2)$then x lies is the interval (A) $(-3, -2)$ (B) (2,3)(C)(3,oo)` (D) none of these

Watch Video Solution

58. Solve :$2\log_x a + \log_{ax} a + 3\log_b a = 0$ where$a > 0, b = a^2 x$

Watch Video Solution

59. Solve:

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

Watch Video Solution

60. If $\log_{10} 343 = 2.5353$ then the least positive integer 'n' such that $7^n > 10^5$ is

Watch Video Solution

61. Show that: `1/(log_2n)+1/(nog_3n)+1/(log_4n)+... +1/(log_43n)=1/(log_43n)

Watch Video Solution

62. Solve : $\log_7 \log_5\left(\sqrt{x+5}+\sqrt{x}\right)=0$

Watch Video Solution

63. For $x > 1$, show that: $2\log_{10} x - \log_x 0.01 \geq 4$

Watch Video Solution

64. The least value of the expression $2(\log)_{10}x - (\log)_x(0.01), f$ or $x > 1,$ is a. 10 b. 2 c. -0.01 d. none of these

Watch Video Solution

65. Show that: $|\log_b a + \log_a b| \geq 2$

Watch Video Solution

66. if $\log_{0.3}(x-1)<\log_{0.09}(x-1)$ the x will lie in the interval

Watch Video Solution

67. solve the equation $x^{\frac{3}{4}(\log_2 x)^2+\log_2 x-\frac{5}{4}}=\sqrt{2}$

Watch Video Solution

68. If $\log_3 2, \log_3(2^x-5)$ and $\log_3\left(2^x-\frac{7}{2}\right)$ are in $A.P$, determine the value of x.

Watch Video Solution

69. The number $(\log)_2 7$ is (1990, 2M) an integer (b) a rational number an irrational number (d) a prime number

Watch Video Solution

70. Number of solutions of $\log_4(x-1)=\log_2(x-3)$ is :

Watch Video Solution

71. If $1, \log_9\left(3^{1-x}+2\right), \log_3(4\cdot 3^x-1)$ are in A.P then x equals to

Watch Video Solution