



MATHS

BOOKS - CENGAGE MATHS (ENGLISH)

LOGARITHM



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

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2. Solve:
$$(\log)_{x+rac{1}{x}}igg(rac{\log_2(x-1)}{x-2}igg)>0$$

$$\textbf{3.}\left(\log\right)_{0.5} \frac{3-x}{x+2} < 0$$



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

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

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

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

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

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) $x(\log)_2(2^x+1)$

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

(d) 32



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

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

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

15. Solve:
$$4(\log)_{rac{x}{2}}ig(\sqrt{x}ig)+2(\log)_{4x}ig(x^2ig)=3(\log)_{2x}ig(x^3ig)$$
 .

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

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17. Solve:
$$rac{1}{4}x^{los_2\sqrt{x}}=\left(2.\ x^{(\log)_2x}rac{1}{4}
ight)$$
.

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

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

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

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

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

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

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

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

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

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

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

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28. Solution set of the inequality
$$\frac{1}{2^x - 1} > \frac{1}{1 - 2^{x - 1}}$$
 is $1, \infty$) (b)
 $0, (\log_2\left(\frac{4}{3}\right)(c)(-1, \infty)\left(0, (\log_2\left(\frac{4}{3}\right) \cup (1, \infty)\right)$

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

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30. Which of the following is not the solution
$$\log_x \left(\frac{5}{2} - \frac{1}{x}\right) > \left(\frac{5}{2} - \frac{1}{x}\right)?$$
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31. The equation
$$\frac{x^3}{4} ((\log)_2 x)^{2+(\log)_2 x - \frac{5}{4}} = \sqrt{2}$$
 has at least one real solution exactly three solutions exactly one irrational solution complex roots
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32. Solve the following equation of
$$x: 2(\log)_x a + (\log)_{ax} a + 3(\log)_{a^2x} a = 0, a > 0$$
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33. Solve for
$$x: 4^x 3^{x-1/2} = 3^{x+1/2} - 2^{2x-1}$$
.

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 $\log_{10} P - \log_{10} Q$



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

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36.

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

If

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 $\frac{LM}{N}$.

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

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



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?

41. If $(\log)_{10}2 = 0.30103, (\log)_{10}3 = 0.47712$, then find the number of digits in $3^{12} \cdot 2^8$

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



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

44. If $(\log)_k x \log_5 k = (\log)_x 5, k \neq 1, k > 0$, then x is equal to k (b) 1/5 (c) 5 (d) none of these

45. If $p, q \in N$ satisfy the equation $x^{\sqrt{x}} = (\sqrt{x})^x$, 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

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

A.
$$(-4, -3)$$

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

C. $(-3,\infty)$

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

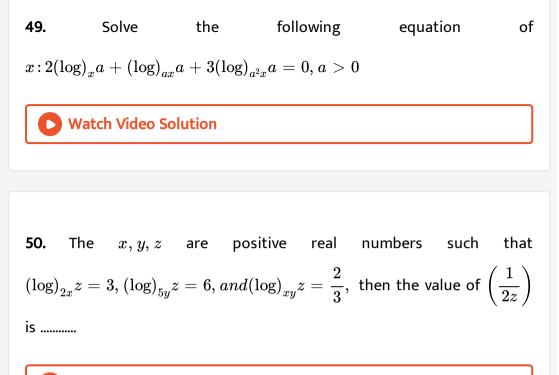
Answer: D



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

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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) $\left(\frac{1 + \sqrt{21}}{2}, \infty\right)$

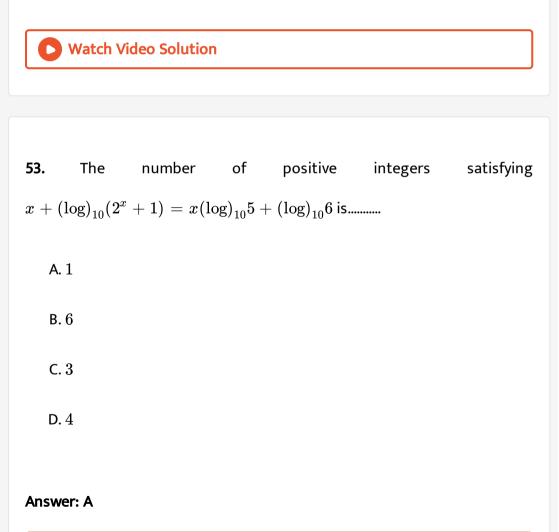


51. Which of the following, when simplified, reduces to unity? (a)

$$(\log)_{10} 5 \log_{10} 20 + ((\log)_{10} 2)^2 \qquad \text{(b)} \qquad \frac{2 \log 2 + \log 3}{\log 48 - \log 4} \qquad .$$
 (c)

$$- (\log)_5 (\log)_3 \sqrt{5\sqrt{9}} \text{ (d)} \ \frac{1}{6} (\log)_{\frac{\sqrt{3}}{2}} \left(\frac{64}{27}\right) \qquad .$$

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.



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

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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

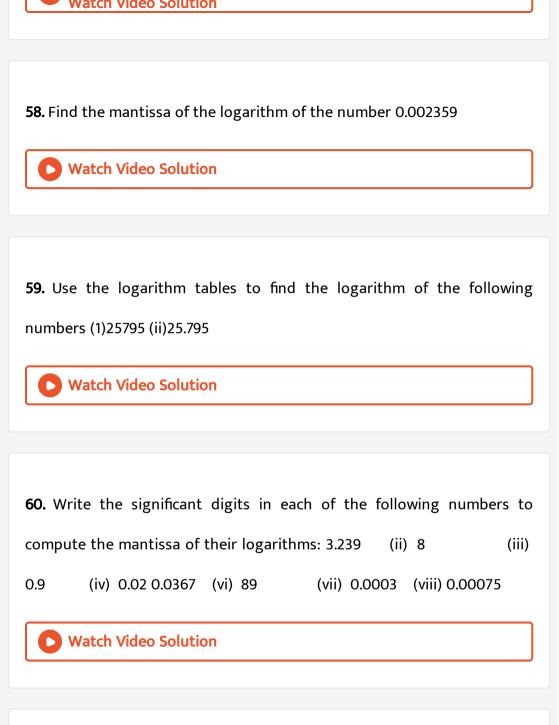
0.35792 (vi) 0.034239 (vii) 0.002385 (viii) 0.0009468

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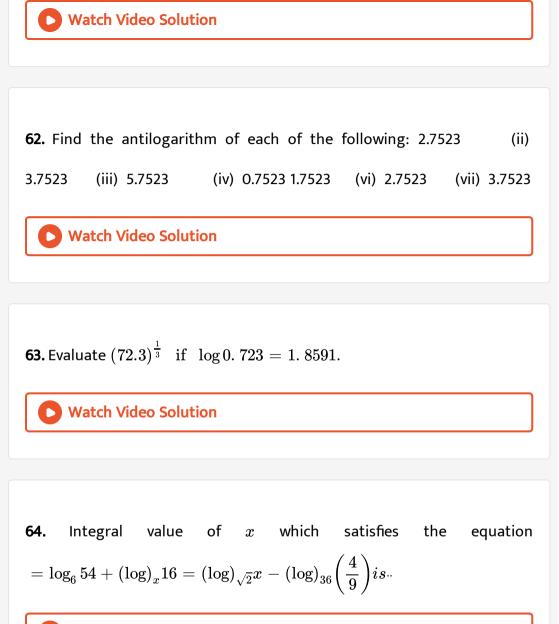
56. Solve:
$$(\log)_{0.1} \left((\log)_2 \left(\frac{x^2 + 1}{x - 1} \right) < 0 \right)$$

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57. Solve:
$$rac{x-1}{\left(\log
ight)_{3}(9-3^{x})-3}\leq 1.$$



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



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



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

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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.....

 $\mathsf{A.}\,2$

 $\mathsf{B.}\,3$

 $\mathsf{C}.-2$

 $\mathsf{D.}-3$

Answer: B



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

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69. The value of
$$\left(6a^{(\log)_e b}((\log)_{a^2}b)\frac{(\log)_{b^2}a}{e^{(\log)_e a}(\log)_e b}is$$
 (a) independent of

a (b) independent of b (c)independent of aand b (d) dependent on b

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

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



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.....

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

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.....

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



75. The number of elements in set of all x satisfying the equation

$$x^{\log_3 x^2 + \left(\, \log_3 x \,
ight)^2 - 10} = rac{1}{x^2} is$$
 (a)1 (b) 2 (c) 3 (d) 0

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

A. 0

 $\mathsf{B.}\,2$

C. 3

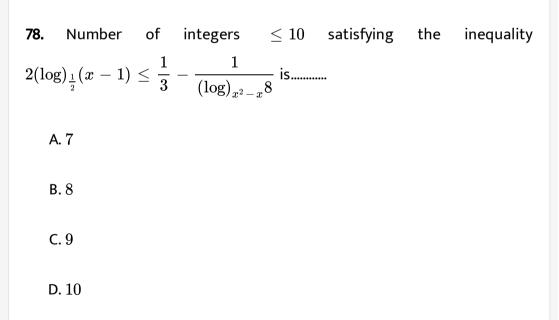
 $\mathsf{D.4}$

Answer: B

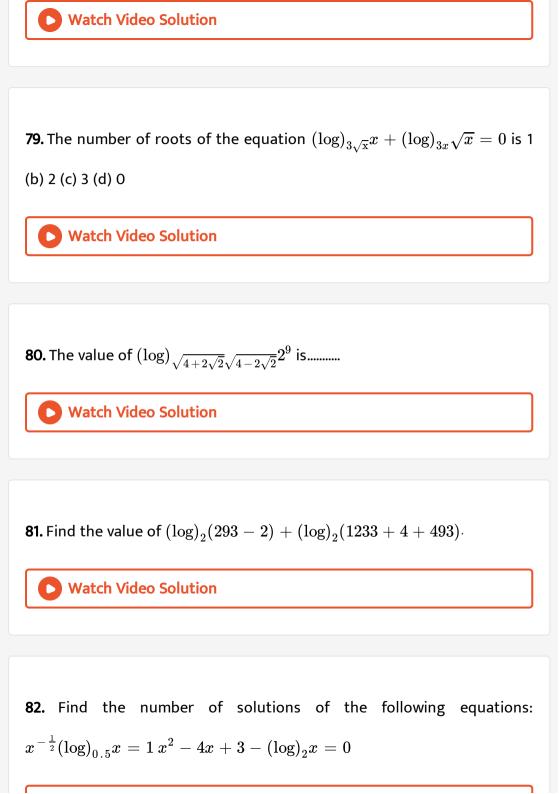


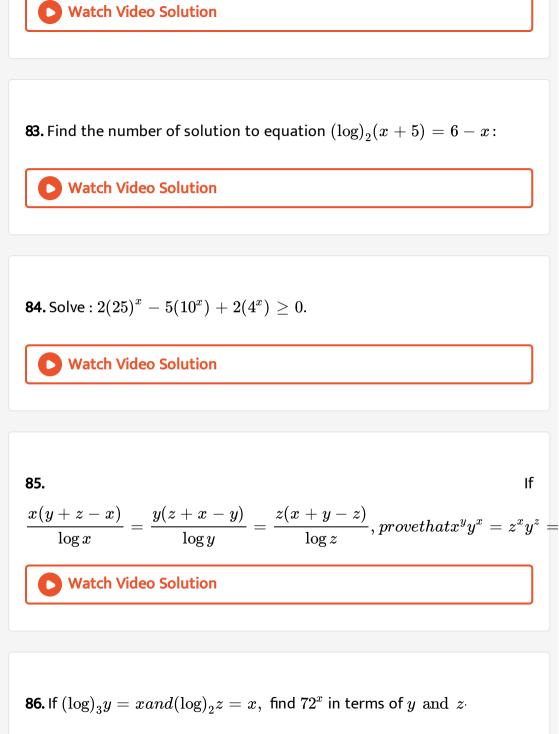
77. Let a>1 be a real number. Then the number of roots equation $a^{2\,(\log)_2 x}=15+4x^{\,(\log)_2 a}$ is 2 (b) infinite (c) 0 (d) 1

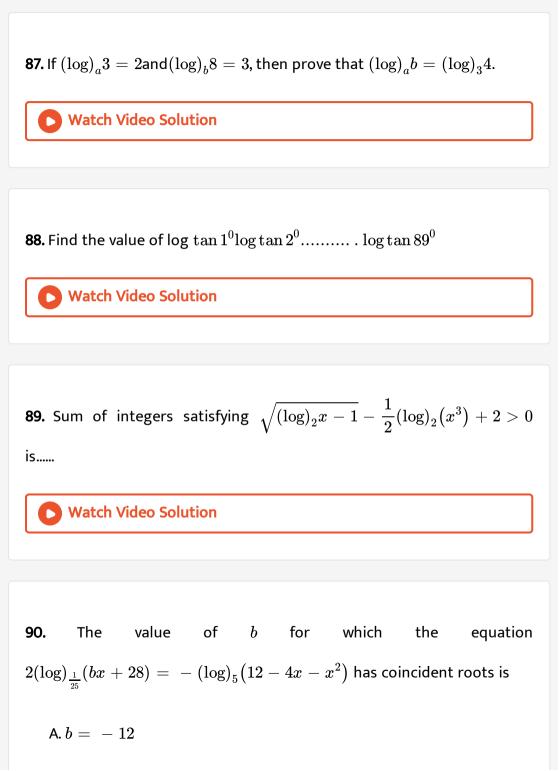




Answer: C







B. b = 4 or b = -12

C. b = 4 or b = 12

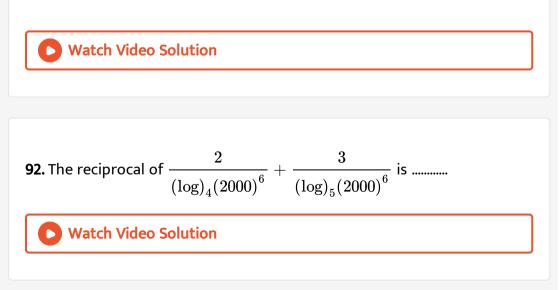
D. b = -12

Answer: B

.



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



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

is.....

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

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

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96. If
$$\log_e\left(rac{a+b}{2}
ight)=rac{1}{2}(\log_e a+\log_e b),$$
 then find the relation

between aandb-

97. If $2x^{\,(\log)_43}+3^{(\log)_4x}=27,\,$ then x is equal to

98. The value of $\log ab - \log \lvert b \rvert = \log a$ (b) $\log \lvert a \rvert$ (c) $-\log a$ (d) none of

these

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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

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

101. The number of $N=6-\left(6(\log)_{10}2+(\log)_{10}31
ight)$ lies between two

successive integers whose sum is equal to (a)5 (b) 7 (c) 9 (c) 10

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

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103.

Solve:

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

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

105.

$$rac{(\log)_a N}{(\log)_c N} = rac{(\log)_a N - (\log)_b N}{(\log)_b N - (\log)_c N}, where N > 0 and N
eq 1, a, b, c > 0$$

If

and not equal to 1, then prove that $b^2=ac$

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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.

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

108. Let $a=(\log)_3(\log)_32$. An integer k satisfying $1<2^{-k+3^{(-a)}}<2,$

must be less than

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

A. $3\sqrt{2}$

.

B. $\sqrt{2}$

C. 4

D. 6

Answer: C

110.
$$(\log)_{x-1} x (\log)_{x-2} (x-1) \dots (\log)_{x-12} (x-11) = 2, x$$
 is equal to:
9 (b) 16 (c) 25 (d) none of these

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) $f(x) + f(x+1) = f(x^2+x)$ (d)
 $f(x_1) + f(x_2) = f\left(\frac{x_1+x_2}{1+x_1x_2}\right)$

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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

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) $\frac{3}{2}$

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

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

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

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) $\frac{2a + 5b - 2}{3a + b - 1}$

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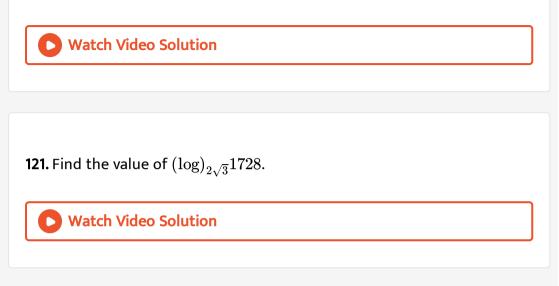
118. There exists a natural number N which is 50 times its own logarithm

to the base 10, then N is divisible by

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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

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



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

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

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

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

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

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

is (a)10 (b)2 (c) $-0.\ 01$ (d)4

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



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

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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) $a^2, b^2, c^2are \in A\dot{P}$ a, b, c are in $G\dot{P}$ (d) a, b, c are in $H\dot{P}$.

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

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) $(\log)_2 ((\log)_2 9)$

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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.

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

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

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

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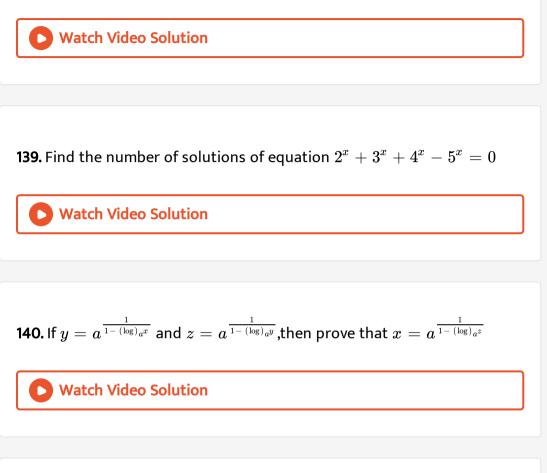
137. Solve :
$$3^{(\log_9 x)} imes 2 = 3\sqrt{3}$$

138. Solve the inequality
$$\sqrt{(\log)_2 igg(rac{2x-3}{x-1}igg)} < 1$$

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

B. $x \in (-\infty,1)$
C. $x \in (-2,\infty)$
D. $x \in (-\infty,1) \cup \left(rac{3}{2},\infty
ight)$

Answer: A



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

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 $(b - d)$.

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

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144. If $(\log)_3ig\{5+4(\log)_3(x-1)ig\}=2,\,\,$ then x is equal to 4 (b) 3 (c) 8

(d) $(\log)_2 16$

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

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

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

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

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

D. none of these

Answer: C

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



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



150.

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

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

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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]



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

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

number composite number (d) irrational

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

155. Find the value of
$$\left(\frac{1}{49}\right)^{1+(\log)_7 2} + 5^{-1(\log)_5 (7)}$$

156. Prove that:
$$2^{\left(\sqrt{\left(\log\right)_{a}4\sqrt{ab}+\left(\log\right)_{b}4\sqrt{ab}}-\sqrt{\left(\log\right)_{a}4\sqrt{\frac{b}{a}}+\left(\log\right)_{b}4\sqrt{\frac{a}{b}}}\right)}\sqrt{\left(\log\right)_{a}b}=\begin{cases} 2 & \text{if } b \geq a \end{cases}$$

 ${\sf if}\,1$



157. Prove that
$$rac{2^{(\log)_2rac{1}{4}x}-3^{(\log)_{27}\left(x^2+1
ight)^3}-2x}{7^{4(\log)_{49}x}-x-1}>0$$

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

159. Which of the following pairs of expression are defined for the same set of values of x? $f_1(x) = 2(\log)_2 x and f_2(x) = (\log)_{10} x^2$ $f_1(x) = (\log)x_{\times}^2 and f_2(x) = 2$ $f_1(x) = (\log)_{10}(x-2) + (\log)_{10}(x-3)and f_{2(x)} = (\log)_{10}(x-2)(x-3)$

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

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

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

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

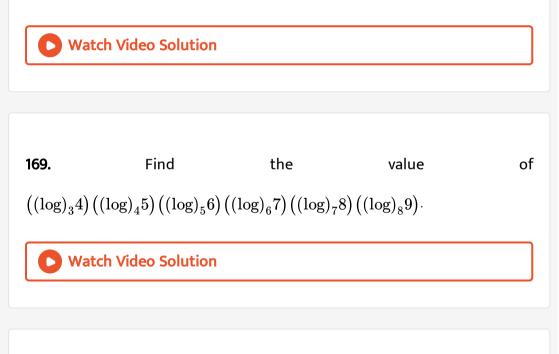
164. Suppose x, y, z = 0 and are not equal to 1 and $\log x + \log y + \log z = 0$. Find the value of $\frac{1}{x^{\log y}} + \frac{1}{(\log z)} \frac{1}{y^{\log z}} + \frac{1}{(\log x)} \frac{1}{z^{\log x}} + \frac{1}{(\log y)}$ Watch Video Solution

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

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

167. Simplify:
$$\frac{1}{1 + (\log)_a bc} + \frac{1}{1 + (\log)_b ca} + \frac{1}{1 + (\log)_c ab}$$
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168. If $a^x = b, b^y = c, c^z = a$, then find the value of xyz.



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

