



MATHS

BOOKS - PEARSON IIT JEE FOUNDATION

LOGARITHMS

Example

1. If $p = \log_{2a} a$, $q = \log_{3a} 2a$ and $r = \log_{4a} 3a$, then find the value of $qr(2-p)$.

A. 1

B. 0

C. 2

D. 3

Answer:



Watch Video Solution

2. If $3^x = (0.3)^y = 10000$, then find the value of $\frac{1}{x} - \frac{1}{y}$.

A. 1

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

C. $\frac{1}{4}$

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

Answer: C



Watch Video Solution

3. If $(2x)^{\log_{\sqrt{x}} x} = 16$, then find the value of x .

A. 2

B. -2

C. Both (a) and (b)

D. None of these

Answer: A



[Watch Video Solution](#)

4. Find the value of $3^{\frac{4}{\log_2 9}} + 27^{\frac{1}{\log_4 9}} + 81^{\frac{1}{\log_4 3}}$

A. 603

B. 585

C. 676

D. 524

Answer:



[Watch Video Solution](#)

5. If $p \in R$ and $q = \log_x \left(p + \sqrt{p^2 + 1} \right)$, then find the value of p in terms of x and q .

A. $\frac{x^q + x^{-q}}{2}$

B. $\frac{x^q - x^{-q}}{2}$

C. $x^q + x^{-q}$

D. $x^q - x^{-q}$

Answer:

 [Watch Video Solution](#)

6. Express -0.5229 in the standard form and locate it on the number line.

 [Watch Video Solution](#)

7. Find the value of $\log 36$, $\log 3600$ and $\log 0.0036$.



 [Watch Video Solution](#)

8. Find the value of $\log 36$, $\log 3600$ and $\log 0.0036$.

 [Watch Video Solution](#)

9. Find the value of $\log 36$, $\log 3600$ and $\log 0.0036$.

 [Watch Video Solution](#)

10. Find the antilog of 2.421.

 [View Text Solution](#)

11. Find the antilog of 1.4215.

 [Watch Video Solution](#)

12. Find the value of $\frac{\ln 8 \times \ln 81}{\ln 16 \times \ln 9}$.

 [Watch Video Solution](#)

13. If $\log_{10} 4 = 0.6021$ and $\log_{10} 5 = 0.6990$, then find the value of $\log_{10} 1600$.

 [Watch Video Solution](#)

14. Find the value of $\sqrt[3]{16.51}$ approximately.

 [Watch Video Solution](#)

Very Short Answer Type Questions

1. $\frac{1}{5} \log_2 32 + 3 \log_{64} 4 = \text{_____}$.

 [Watch Video Solution](#)

2. The characteristic of the logarithm of 3.6275 is _____.

 [Watch Video Solution](#)

3. If $4 \log_x 8 = 3$, then $x =$ _____.

 [Watch Video Solution](#)

4. If $\log x - \frac{2}{3} \log x = 1$, then $x =$ _____.

 [Watch Video Solution](#)

5. If $a = \log. \frac{3}{2}$, $b = \log. \frac{4}{25}$ and $c = \log. \frac{5}{9}$, then $a + b + c =$ _____.

 [Watch Video Solution](#)

6. The number of digits in the integral part of the number whose logarithm is 4.8345 is _____.

 [Watch Video Solution](#)

7. If $\log x = 32.756$, then $\log 10x =$ _____.

 [Watch Video Solution](#)

8. The characteristic of the logarithm of 0.0062 is _____.

 [View Text Solution](#)

9. If $\log_a x$ (where $a > 1$) is positive, then the range of x is _____.

 [Watch Video Solution](#)

10. If $\log 27.91 = 1.4458$, then $\log 2.791 = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

11. $\frac{\log 15 - \log 6}{\log 20 - \log 8} = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

12. If $\log 2 = 0.3010$, then $\log 5 = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

13. The value of $\log_{16} \sqrt[5]{64} = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

14. $\frac{\log 216}{\log 6} = \underline{\hspace{2cm}}$.



Watch Video Solution

15. If $\log_4 3 = x$, then $\log_{4\sqrt{3}} \sqrt[4]{64} = \text{_____}$.



Watch Video Solution

16. If $\log_x \left(\frac{1}{243} \right) = -5$, then find the value of x .

A. 3

B. 4

C. 5

D. 7

Answer: A



Watch Video Solution

17. $7^{\log_{343} 27} = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

18. If $3^{\log_9 x} = 2$, then $x = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

19. If $\log_{xyz} x + \log_{xyz} y + \log_{xyz} z = \log_{10} p$, then $p = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

20. If $\log_{10} 4 + \log_{10} m = 2$, then $m = \underline{\hspace{2cm}}$.

 [Watch Video Solution](#)

21. Simplify: $3 \log_3 5 + \log_3 10 - \log_3 625$.



[Watch Video Solution](#)

22. If $\log(a + 1) + \log(a - 1) = \log 15$, then $a = \underline{\hspace{2cm}}$.



[Watch Video Solution](#)

23. The value of $\log 10 + \log 100 + \log 1000 + \dots + \log 10000000000 = \underline{\hspace{2cm}}$.



[Watch Video Solution](#)

24. If the number of zeroes between the decimal point and the first non-zero digit of a number is 2, then the characteristic of logarithm of that number is $\underline{\hspace{2cm}}$.



[View Text Solution](#)

25. The value of

$$\log(\tan 10^\circ) + \log(\tan 20^\circ) + \log(\tan 45^\circ) + \log(\tan 70^\circ) + \log(\tan 80^\circ) \\ = \text{-----}.$$



Watch Video Solution

Short Answer Type Questions

1. Simplify: $\log\left(\frac{3}{8}\right) + \log\left(\frac{45}{8}\right) - \log\left(\frac{15}{16}\right)$.



Watch Video Solution

2. Show that $\frac{1}{\log_a abc} + \frac{1}{\log_b abc} + \frac{1}{\log_c abc} = 1$.



Watch Video Solution

3. Solve for real value of x: $\log(x - 1) + \log(x^2 + x + 1) = \log 999$.



[Watch Video Solution](#)

4. If $\frac{1}{1 + \log_a 10} = \frac{3}{2}$, then find the value of a .



[Watch Video Solution](#)

5. If $x^2 + y^2 = 23xy$, then show that $2\log(x + y) = 2\log 5 + \log x + \log y$.



[Watch Video Solution](#)

6. If $\log_{10} 2 = 0.3010$ and $\log_{10} 3 = 0.4771$, then find the value $\log_{10} 135$.



[Watch Video Solution](#)

7. If $\log_{10} 2 = x$ and $\log_{10} 3 = y$, then find $\log_{10} 21.6$.



[Watch Video Solution](#)

8. If $\log_{10} 2 = 0.3010$, then find the number of digits in $(64)^{10}$.

 [Watch Video Solution](#)

9. Simplify $\frac{1}{\log_2 \log_2 \log_2 256}$.

 [Watch Video Solution](#)

10. Prove that $\log_3 810 = 4 + \log_3 10$.

 [Watch Video Solution](#)

Essay Type Questions

1. Solve: $x^{\log_4 3} + 3^{\log_4 x} = 18$.

 [Watch Video Solution](#)

2. If $p^2 + q^2 = 14pq$, then prove that $\log\left(\frac{p+q}{4}\right) = \frac{1}{2}[\log p + \log q]$

 [Watch Video Solution](#)

3. Without using tables, find the value of $4\log_{10} 5 + 5\log_{10} 2 - \frac{1}{2}\log_{10} 4$.

 [Watch Video Solution](#)

4. If $\frac{\log a}{b-c} = \frac{\log b}{c-a} = \frac{\log c}{a-b}$, then prove that $a^a b^b c^c = 1$.

 [Watch Video Solution](#)

5. Arrange the following numbers in the increasing order of their magnitude. $\log_7 9$, $\log_{18} 16$, $\log_6 41$, $\log_2 10$.

 [Watch Video Solution](#)

1. If $\log_{16} x = 2.5$, then $x = \underline{\hspace{2cm}}$.

- A. 40
- B. 256
- C. 1024
- D. 1025

Answer: C



[Watch Video Solution](#)

2. If $\log 5 = 0.699$ and $(1000)^x = 5$, then find the value of x .

- A. 0.0699
- B. 0.0233
- C. 0.0233

D. 10

Answer: C



Watch Video Solution

3. The value of $\log\left(\frac{18}{14}\right) + \log\left(\frac{35}{48}\right) - \log\left(\frac{15}{16}\right) =$

A. 0

B. 1

C. 2

D. $\log_{16} 15$

Answer: A



Watch Video Solution

4. If $\log_3 a + \log_9 a + \log_{81} a = \frac{35}{4}$, then $a =$ _____.

A. 27

B. 243

C. 81

D. 240

Answer: B



[Watch Video Solution](#)

5. If $\log_9[(\log_8 x)] < 0$, then x belongs to _____.

A. (1, 8)

B. $(-\infty, 8)$

C. $(8, \infty)$

D. (8, 1)

Answer: A



[Watch Video Solution](#)

6. If $\log_3 \frac{x^3}{3} - 2\log_3 3x^3 = a - b\log_3 x$, then find the value of $a + b$.

A. 6

B. -6

C. 0

D. -3

Answer: C



[Watch Video Solution](#)

7. The value of $\log_{40} 5$ lies between _____.

A. $\frac{1}{3}$ and $\frac{1}{2}$

B. $\frac{1}{4}$ and $\frac{1}{3}$

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

D. 2 and 3

Answer: A



Watch Video Solution

8. If $x = \log_{\frac{1}{2}} \cdot \frac{4}{3} \cdot \log_2 \cdot \frac{1}{3} \cdot \log_{\frac{2}{3}} 0.8$, then _____.

A. $x > 0$

B. $x < 0$

C. $x = 0$

D. $x \geq 0$

Answer: A



Watch Video Solution

9. If $\log_{144} 729 = x$, then the value of $\log_{36} 256$ is _____.

- A. $\frac{4(3-x)}{(3+x)}$
- B. $\frac{4(3+x)}{(3-x)}$
- C. $\frac{(3+x)}{4(3-x)}$
- D. $\frac{(3-x)}{4(3+x)}$

Answer: A



Watch Video Solution

10. The solution set of the equation $\log(2x - 5) - \log 3 = \log 4 - \log(x + 9)$

is _____.

- A. $\left\{ \frac{-19}{2}, 3 \right\}$
- B. $\left\{ -3, \frac{19}{2} \right\}$
- C. $\left\{ 3, \frac{19}{2} \right\}$
- D. $\{3\}$

Answer: D



Watch Video Solution

11.

If

$$\log_{10} \tan 19^\circ + \log_{10} \tan 21^\circ + \log_{10} \tan 37^\circ + \log_{10} \tan 45^\circ + \log_{10} \tan 69^\circ$$

, then $x = \underline{\hspace{2cm}}$.

A. 0

B. 1

C. 2

D. 4

Answer: C



Watch Video Solution

12. The solution set of the equation $\log (x + 6) - \log 8 = \log 9 - \log (x + 7)$ is

$\underline{\hspace{2cm}}$.

A. $\{-15, 2\}$

B. $\{2\}$

C. $\{-15, 0, 2\}$

D. $\{0, 2\}$

Answer: B



Watch Video Solution

13. If $\log_{40} 4 = x$ and $\log_{40} 5 = y$, then express $\log_{40} 32$ in terms of x and y .

A. $5(1 + x + y)$

B. $5(1 - x + y)$

C. $5(1 - x - y)$

D. $5(1 + x - y)$

Answer: C

 [Watch Video Solution](#)

14. If $\log_{10} 11 = p$, then $\log_{10} \left(\frac{1}{110} \right) = \text{-----}$.

A. $(1 + p)^{-1}$

B. $-(1 + p)$

C. $1-p$

D. $\frac{1}{10p}$

Answer: B

 [Watch Video Solution](#)

15. If $\log_4 \cdot \frac{x^4}{4} + 3 \log_4 4x^4 = p + q \log_4 x$, then the value of $\log_p(q)$ is
-----.

A. 4

B. -4

C. 3

D. 2

Answer: A



Watch Video Solution

16. If $\log_4 x + \log_8 x^2 + \log_{16} x^3 = \frac{23}{2}$, then $\log_x 8 =$

A. 2

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

C. 3

D. $\frac{3}{4}$

Answer: B



Watch Video Solution

17. If $\log_{(x+y)}(x-y) = 7$, then the value of $\log_{(x^2-y^2)}(x^2 + 2xy + y^2)$ is _____.

A. 14

B. $\frac{2}{7}$

C. $\frac{7}{2}$

D. $\frac{1}{4}$

Answer: D



Watch Video Solution

18. The value of $\log_{35} 3$ lies between _____.

A. $\frac{1}{4}$ and $\frac{1}{3}$

B. $\frac{1}{3}$ and $\frac{1}{2}$

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

D. 3 and 4

Answer: A



Watch Video Solution

19. If $\log\left(\frac{a+b}{6}\right) = \frac{1}{2}(\log a + \log b)$, then $\frac{a}{b} + \frac{b}{a} = \text{-----}$.

A. 30

B. 31

C. 32

D. 34

Answer: D



Watch Video Solution

20. If $\log_p q = x$, then $\log_{1/p}\left(\frac{1}{q}\right) = \text{-----}$.

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

B. $-x$

C. x

D. x^2

Answer: C



Watch Video Solution

21. If $\log_{(x-y)}(x+y) = 5$, then what is the value of $\log_{x^2-y^2}(x^2 - 2xy + y^2)$?

A. 1

B. $\frac{\sqrt{5}}{3}$

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

D. 0

Answer: C



Watch Video Solution

22. The value of $\log_a 1 + \log_2 2^2 + \log_3 3^3$ (where a is a positive number and $a \neq 1$) is _____.

A. 210

B. 209

C. 145

D. 89

Answer: B



[Watch Video Solution](#)

23. $\log_{1/2} \frac{2}{3}$ _____ $\log_{2/3} \frac{1}{2}$. The appropriate symbol in the blank is

A. >

B. <

C. =

D. Cannot be determined

Answer: B



[Watch Video Solution](#)

24. The value of $\log_3 [\log_2 \{ \log_4 (\log_5 625^4) \}]$ is _____.

A. 0

B. 1

C. 2

D. $3 \log 4$

Answer: A



[Watch Video Solution](#)

25. If $\log(x - 3) + \log(x + 2) = \log(x^2 + x - 6)$, then the real value of x , which satisfies the above equation is

- A. is any value of x
- B. is any value of x except $x = 0$
- C. is any values of x except $x = 3$
- D. Does not exist.

Answer: D



[Watch Video Solution](#)

Level 2

1. If $\log \left(\sqrt{b\sqrt{b\sqrt{b\sqrt{b}}}} \right) \left(\sqrt{a\sqrt{a\sqrt{a\sqrt{a\sqrt{a}}}}} \right) = x \log_b a$, then $x =$

A. $\frac{32}{16}$

B. $\frac{31}{15}$

C. $\frac{31}{30}$

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

Answer: C



Watch Video Solution

2. If $7^{\log x} + x^{\log 7} = 98$, then $\log_{10} \sqrt{x} = \underline{\hspace{2cm}}$.

A. 47

B. 51

C. 14

D. 49

Answer: B



Watch Video Solution

3. If $7^{\log x} + x^{\log 7} = 98$, then $\log_{10} \sqrt{x} = \underline{\hspace{2cm}}$.

A. 1

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

C. 2

D. 0

Answer: A



Watch Video Solution

4. The value of $\log_b a + \log_{b^2} a^2 + \log_{b^3} a^3 + \dots + \log_{b^n} a^n$

A. n

B. $\log_b a$

C. $\frac{n(n+1)}{2} \log_b a$

D. $\log_b a^n$

Answer: D



Watch Video Solution

5. If $\log_4(\log_2 x) + \log_2(\log_4 x) = 2$, then find $\log_x 4$.

A. 2

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

C. 1

D. 0

Answer: B



Watch Video Solution

6. If $pqr = 1$ then find the value of $\log_{rq} p + \log_{rp} q + \log_{pq} r$.

A. 0

B. -1

C. -3

D. 1

Answer: C



Watch Video Solution

7. If $\log_3 [\log_2 \{ \log_x (\log_6 216^3) \}] = 0$, then $\log_3(3x) = \underline{\hspace{2cm}}$.

A. $\log_{23} 12$

B. 1

C. 2

D. $\log_3 6$

Answer: C



Watch Video Solution

8. If a^x , b^x and c^x are in GP, then which of the following is/are true?

(A) a, b, c are in GP

(B) $\log a$, $\log b$, $\log c$ are in GP

(C) $\log a$, $\log b$, $\log c$ are in AP

(D) a, b, c are in AP

A. A and B

B. A and C

C. B and D

D. Only A

Answer: B



Watch Video Solution

9. The value of $\frac{1}{\log_3 n} + \frac{1}{\log_4 n} + \frac{1}{\log_5 n} + \dots + \frac{1}{\log_8 n}$ is _____.

A. $\log_n 8!$

B. $\log_n 8$

C. $\log_n \left(\frac{8!}{2} \right)$

D. $\log_n 8!$

Answer: C



Watch Video Solution

10. $\frac{\log a}{y - z} = \frac{\log b}{z - x} = \frac{\log c}{x - y}$ then value of $abc =$

A. $a^x b^y c^z$

B. $a^{y+z} b^{z+x} c^{x+y}$

C. 1

D. All of these

Answer: D



Watch Video Solution

11. If $\frac{1}{\log_x 10} = \frac{3}{\log_p 10} - 3$, then $x = \underline{\hspace{2cm}}$.

A. $100p^2$

B. $\frac{p^2}{100}$

C. $1000p^3$

D. $\frac{p^3}{1000}$

Answer: D



Watch Video Solution

12. If $\log_9 m = 3.5$ and $\log_2 n = 7$, then the value of m in terms of n is $\underline{\hspace{2cm}}$.

A. $n\sqrt{n}$

B. $2n$

C. n^2

D. $\sqrt[3]{n}$

Answer: A



Watch Video Solution

13. If $\log_{12}(\log_7 x) < 0$, then x belong to _____.

A. $(1, \infty)$

B. $(1, 7)$

C. $(1, \infty)$

D. $(1, 7)$

Answer: B



Watch Video Solution

14. The value of $\log_{381} 7$ lies between _____.

A. $\frac{1}{3}$ and $\frac{1}{2}$

B. $\frac{1}{4}$ and $\frac{1}{3}$

C. $\frac{1}{5}$ and $\frac{1}{4}$

D. $\frac{1}{6}$ and $\frac{1}{5}$

Answer: B



Watch Video Solution

15. If $\log_{10} \tan 31^\circ \cdot \log_{10} \tan 32^\circ \dots \log_{10} \tan 60^\circ = \log 10a$, then $a = \underline{\hspace{2cm}}$.

A. 10

B. 1

C. 4

D. 2

Answer: B



Watch Video Solution

1. The solution set for $|1 - x|^{\log_{10}(x^2 - 5x + 5)} = 1$, is _____.

A. $\{0, 1, 4\}$

B. $\{1, 4\}$

C. $\{0, 4\}$

D. $\{0, 2, 4\}$

Answer: C



Watch Video Solution

2. The value of $\log \sqrt{2\sqrt{2\sqrt{2\dots\infty}} \text{ times}} + \log \sqrt{3\sqrt{3\sqrt{3\dots\infty}} \text{ times}}$ is

A. 1

B. 2

C. $\log 5$

D. $\log 6$

Answer: D



[Watch Video Solution](#)

3. The least positive integral value of the expression $\frac{1}{2}\log_{10} m - \log_{m^{-2}} 10$ is _____.

A. 0

B. 1

C. 2

D. -1

Answer: B



[Watch Video Solution](#)

4. The domain of $\log(3 - 5x)$ is _____.

A. $\left(\frac{3}{5}, \infty\right)$

B. $\left(0, \frac{3}{5}\right)$

C. $\left(-\infty, \frac{3}{5}\right)$

D. $\left(-\frac{3}{5}, 0\right)$

Answer: C



Watch Video Solution

5. If $\log_7 x + \log_7 y \geq 2$, then the smallest possible integral value of $x + y$ (given $x \neq y$) is _____.

A. 7

B. 14

C. 15

D. 20

Answer: C



Watch Video Solution

6. If p, q, r are in GP and $a^p = b^q = c^r$, then which of the following is true?

A. $\log_c b = \log_a c$

B. $\log_c b = \log_b a$

C. $\log_c a = \log_b c$

D. None of these

Answer: B



Watch Video Solution

7. The value of $\log_5 \sqrt{5\sqrt{5\sqrt{5\sqrt{5\dots}}}} + \log\left(\frac{1}{2} + \left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^3 + \dots\infty\right)$

is _____.

A. 1

B. 25

C. 10

D. 20

Answer: A



[Watch Video Solution](#)

8. The solution set of $|x + 2|^{\log_{10}(x^2 + 6x + 9)} = 1$ is _____.

A. $\{-3, -4\}$

B. $\{0, -3\}$

C. $\{-4, -1\}$

D. $\{-3, -1\}$

Answer: C



[Watch Video Solution](#)

9. If $\log_p pq = x$, then $\log_q pq =$ _____.

A. $\frac{x}{x-1}$

B. $\frac{x-1}{x}$

C. $\frac{x}{x+1}$

D. $\frac{x+1}{x}$

Answer: A



Watch Video Solution

10. If $\log_{1/8}(\log_4(x^2 - 5)) > 0$, then _____.

A. $x \in (-\infty, -3) \cup (3, \infty)$

B. $x \in (-\infty, -\sqrt{6}) \cup (\sqrt{6}, \infty)$

C. $x \in (-3, \sqrt{6}) \cup (\sqrt{6}, \infty)$

$$D. x \in (-3, -\sqrt{6}) \cup (\sqrt{6}, 3)$$

Answer: D



Watch Video Solution

11. If $p = \log_a bc$, $q = \log_b ca$ and $r = \log_c ab$, then which of the following is true ?

A. $p + q + r + 2 = pqr$

B. $pqr = 2$

C. $p + q + r = pqr$

D. $pqr = 1$

Answer: A



Watch Video Solution

12. If $\log_2 p + \log_8 p + \log_{32} p = \frac{46}{5}$, then $p =$

A. 128

B. 64

C. 32

D. 256

Answer: B



[Watch Video Solution](#)

13. If p and q are positive numbers other than 1, then the least value of

$|\log_q p + \log_p q|$ is _____.

A. 3

B. 1

C. 2

D. 4

Answer: C



Watch Video Solution

14. If $\log_{48} 81 = x$, then $\log_{12} 3 = \underline{\hspace{2cm}}$.

A. $\frac{x + 4}{2x}$

B. $\frac{x + 4}{x}$

C. $\frac{x}{x + 4}$

D. $\frac{2x}{x + 4}$

Answer: D



Watch Video Solution

15. If $\log_l p$, $\log_m p$ and $\log_n p$ are in AP, then $(\ln)^{\log_l m} = \underline{\hspace{2cm}}$.

A. n^2

B. m^2

C. l^2

D. p^2 .

Answer: A



Watch Video Solution