MATHS

BOOKS - MTG WBJEE MATHS (HINGLISH)

LOGARITHMS

Wb Jee Workout Category 1 Single Option Correct Type

1. The value of $\log_6\left(216\sqrt{6}\right)$ is equal to

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

B. $\frac{5}{2}$

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

D. $\frac{9}{2}$

Answer: C

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2. The value of $\frac{\log_8 17}{\log_9 23} - \frac{\log_{2\sqrt{2}} 17}{\log_3 23}$ is equal to

A. 0

B. 1

C. $\frac{17}{8}$

D. $\frac{23}{17}$

Answer: A

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

A. 1

B. 2

C. -1

D. None of these

Answer: A

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4. If $(\log)_{10}2 = 0.30103, (\log)_{10}3 = 0.47712,$ then find the number of digits in $3^{12}x2^{8}$.

A. 7

B. 11

C. 9

D. 10

Answer: C

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5. if $a^2 + 4b^2 = 12ab,$ then $\log(a + 2b)$

A. $\frac{1}{2}$[log a + log b - log 2]

B. $\log \frac{a}{2} + \log \frac{b}{2}$ + log 2

C. $\frac{1}{2}$[log a + log b + 4 log 2]

D. $\frac{1}{2}$ [log a - log b + 4 log 2]

Answer: C

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6. $\frac{1}{\log_a(ab) + \frac{1}{\log_b(ab) = 1}}$

A. 0

B. 1

C. log ab

D. None of these

Answer: A

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7. If $\log_3 x \log_y 3 \log_2 y = 5$, then x =

A. $3y^5$

B. 243

C. 32

D. None of these

Answer: C

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8. If $\log_{10} 2 = 0.030103, \log_{10} 50 =$

A. 2.30103

B. 2.698987

C. 1.99897

D. 0.69897

Answer: C

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9. If $\log_{16} x + \log_x x + \log_2 x = 14$, then x =

A. 16

B. 32

C. 64

D. 256

Answer: D

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10. If a, ,b c, are in G.P., then $\log_a n, \log_b n, \log_c n$are in

A. A.P.

B. G.P.

C. H.P.

D. None of these

Answer: C

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11. If $\frac{1}{\log_a x} + \frac{1}{\log_c x} = \frac{2}{\log_b x}$ then a, b, c, are in

A. A.P.

B. G.P.

C. H.P.

D. None of these

Answer: B

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12. $\log_{10} \tan 1^\circ + \log_{10} \tan 2^\circ + ... + \log_{10} \tan 89^\circ$ =

A. 0

B. 1

C. 2

D. 3

Answer: A

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13. For $y = \log_a x$ to be defined 'a' must be

A. any + ve real number

B. any number

C. $\geq$ e

D. any + ve real number $\neq$ 1

Answer: D

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14. $\log_{5\sqrt{5}} 5$ is equal to

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

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

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

D. 2

Answer: A

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15. $7 \log \frac{10}{9} + 3 \log \frac{81}{80}$ =

A. 4 log 3 - 2 log 5 - 5 log 2

B. 3 log 4- 5 log 2 - 2 log 5

C. 4 log 5 -2 log 3-5 log 2

D. none of these

Answer: C

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16. Given that $\log_a x = \frac{1}{\alpha}$, $\log_b x = \frac{1}{\beta}$ and $\log_c x = \frac{1}{\gamma}$ Then find $\log_{abc} x$

A. $\alpha + \beta + \gamma$

B. $\alpha\beta\gamma$

C. $\frac{1}{\alpha + \beta + \gamma}$

D. None of these

Answer: C

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17. If $(\log)_{10}2 = 0.3010$ the value of $(\log)_{10}25$ is 0.6020 b. 1.2040 c. 1.3980 d. 1.5050

A. 1.5

B. 1.2

C. 1.34

D. none of these

Answer: A

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18. $\sum_{r=2}^{43} \frac{1}{\log_r n} =$

A. $\log_n 43$

B. $\log_{43} n$

C. $\log_{43!} n$

D. $\frac{1}{\log_{43!} n}$

Answer: D

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19. Given $\log_{10} 343 = 2.5353$, the least integer n such that $7^n > 10^{10}$ is

A. 10

B. 11

C. 12

D. 13

Answer: C

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

A. 10

B. 2

C. 0.1

D. 4

Answer: D

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21. If $a = \log_{245} 175$ and $b = \log_{1715} 875$, then the value of $\frac{1-ab}{a-b}$ is _____.

A. 7

B. 5

C. -5

D. -7

Answer: B

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22. If $\log_5 \log_5 \log_3 x = 0$, then value of x is

A. 243

B. 125

C. 625

D. 25

Answer: A

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23. Find the value of $\left(\frac{1}{\log_3 12} + \frac{1}{\log_4 12}\right)$

A. 0

B. $1/2$

C. 1

D. 2

Answer: C

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24. The value of $\frac{\log_3 5 \times \log_{25} 27 \times \log_{49} 7}{\log_{81} 3}$ is

A. 1

B. 6

C. $\frac{2}{3}$

D. 3

Answer: D

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25. If $\log_7 2 = \lambda$, then the value of $\log_{49}(28)$ is

A. $(2\lambda + 1)$

B. $(2\lambda + 3)$

C. $\frac{1}{2}(2\lambda + 1)$

D. $2(2\lambda + 1)$

Answer: C

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26. If $a = \log_4 5$ and $b = \log_5 6$, then $\log_2 3$ =

A. $1 - 2ab$

B. $1 + 2ab$

C. $2ab - 1$

D. $\frac{a-b}{a+b}$

Answer: C

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27. The minimum value of $2^{(\log_6 3)\cos^2 x} + 3^{(\log_6 2)\sin^2 x}$ is

A. $2^{\log_6 \sqrt{2}}$

B. $3^{\log_6 \sqrt{2}}$

C. $2^{1+\log_6 \sqrt{3}}$

D. $2^{1-\log_6 \sqrt{3}}$

Answer: C

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28. If $\log_{12} 27 = a$, then $\log_6 16 =$

A. $\frac{3-a}{3+a}$

B. $2\left(\frac{3-a}{3+a}\right)$

C. $4\left(\frac{3-a}{3+a}\right)$

D. $\frac{a+3}{a-3}$

Answer: C

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29. The number of solutions of the equation

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

A. 0

B. 1

C. 2

D. >2

Answer: B

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30. If $(\log_5 K)(\log_3 5)(\log_k x) = k$, then the value of x if k = 3 is

A. 20

B. 24

C. 27

D. 29

Answer: C

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Wb Jee Workout Category 2 Single Option Correct Type

1. If x $=\log_a bc$, $y = \log_b ca$, $z = \log_c ab$, then the value of $\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{l+z}$ will be

A. $x + y + z$

B. 1

C. ab + bc + ca

D. abc

Answer: B

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2. If $\log\left(x^2 - 16\right) \leq \log_e(4x - 11)$, then

A. $4 < x \leq 5$

B. $x < -4$ or $x > 4$

C. $-1 \leq x \leq 5$

D. $x < -1$ or $x > 5$

Answer: A

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3. If

$x = \log_c b + \log_b c, y = \log_a c + \log_c a, z = \log_b a + \log_a b, then x^2 + y^2 +$

=

A. $-$ xyz

B. xz +y

C. xy + z

D. xyz

Answer: D

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4. If a $>$ 0, c >0, b $= \sqrt{ac}$ and ac $\neq 1$, $N > 0$, then $\frac{\log_a N - \log_b N}{\log_b N - \log_c N}$ =

A. $\frac{\log_a N}{\log_c N}$

B. $\frac{\log N}{\log C}$

C. $\frac{\log N}{\log a}$

D. none of these

Answer: A

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5. $\frac{1}{\log_2 e} + \frac{1}{\log_2 e^2} + \frac{1}{\log_2 e^4} + \ldots. =$

A. $2\log_e 2$

B. $\log_e 3$

C. $\log_e 2$

D. none of these

Answer: A

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6. If $\frac{a(b+c-a)}{\log a} = \frac{b(c+a-b)}{\log b} = \frac{c(a+b-c)}{\log c}$ then $\frac{a^b . b^a}{c^a . a^c}$ equals

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

B. -1

C. 1

D. none of these

Answer: C

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7. If x = 1 + $\log_a$ bc, y = 1 + $\log_b$ ca, z = 1 + $\log_c$ ab, then xy + yz + zx =

A. x + y + z

B. xyz

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

D. none of these

Answer: B

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8. If $\log_e\left(x^4y\right)$ = a and $\log_e\left(x^2y^2\right) = b,$ then $\log_e \sqrt{y}$ in terms of a and b is

A. $\frac{2b+a}{2}$

B. $\frac{2b-a}{7}$

C. $\frac{2b-a}{6}$

D. none of these

Answer: C

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9. If $\log_3(3+x) + \log_3(8-x) - \log_3(9x-8) = 2 - \log_3 9,$ then x =

A. 4

B. -4

C. -8

D. none of these

Answer: A

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

A. $\frac{1}{2}(a-b)$

B. $\frac{1}{2}$ (log a + log b)

C. $\frac{1}{2}$ log a + log b

D. none of these

Answer: B

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11. The value of $\log ab - \log|b| =$

A. log a

B. log |a|

C. $-$ log a

D. none of these

Answer: B

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12. If 3 $\log_{10}\left(x^2 y\right) = 4 + 2\log_{10} x - \log_{10} y$, where x and y are both + ve, and x - y = $2\sqrt{6}$, then the value of x is

A. $4 + \sqrt{6}$

B. $4 - \sqrt{6}$

C. $\sqrt{6}$

D. none of these

Answer: A

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13. If $\log_{10} x - \log_{10} \sqrt{x} = \frac{2}{\log_{10x}}$. The value of x is

A. 10^{-3}

B. 10^{-2}

C. $\frac{1}{10}$

D. 10

Answer: B

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14. If a= $\log_{24} 12$, $b = \log_{36} 24$, $c = \log_{48} 36$, then 1 + abc is equal to

A. 2 ac

B. 2bc

C. 2ab

D. none of these

Answer: B

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15. Evaluate: $81^{1/\log_s 3} + 27^{\log_g 36} + 3^{4/\log_l 9}$

A. 49

B. 625

C. 216

D. 890

Answer: D

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Wb Jee Workout Category 3 One Or More Than One Option Correct Type

1. If $\log_x 2 \log_{\frac{x}{16}} 2 = \log_{\frac{x}{64}} 2$, then x =

A. 4,8

B. 2,4

C. 8,16

D. none of these

Answer: A

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2. If $\log_{12}$ m = a and $\log_{18}$ m = b , then $\frac{a-2b}{b-2a}$ is

A. $\log_2 3$

B. 1

C. $\log_3 2$

D. none of these

Answer: C

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3. If $2 \log_8 N = p$, $\log_2 2$ N = q , and q - p = 4 , then the value of N is

A. 502

B. 512

C. 416

D. none of these

Answer: B

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4. If y = $a^{\frac{1}{1-\log_a x}}$, $z = a^{\frac{1}{1-\log_a y}}$, then x will be

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

B. $\log_{a^z}$

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

D. none of these

Answer: A

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

A. $x = \frac{1}{3}, y = \frac{1}{3}$

B. $x = \frac{1}{3}, y = \frac{1}{4}$

C. $x = \frac{1}{4}, y = \frac{1}{4}$

D. none of these

Answer: B

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6. $16.4^{x} - 3^{x-\frac{1}{2}} = 3^{x+\frac{1}{2}} - 2^{2x-1}$.

A. 0

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

C. 1

D. $\frac{3}{2}$

Answer: D

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7. 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 :

A. $\log_a 100$

B. $\log_a 1000$

C. 1000

D. 100

Answer: D

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8. If $\frac{1+3+5+\ldots. \quad \text{upto n terms}}{4+7+10+\ldots \quad \text{upto n terms}} = \frac{20}{7 \quad \log_{10} x}$ and $n = \log_{10} x + \log_{10} x^{\frac{1}{2}}$, then x is equal to

A. 10^3

B. 10^5

C. 10^6

D. 10^7

Answer: B

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9. If $a > 0, 2\log_x a + \log_{ax} a + 3\log_{a^2x} a = 0$ then x =

A. $a^{1/2}$

B. $a^{-1/2}$

C. $a^{-2/3}$

D. $a^{-4/3}$

Answer: B::D

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10. If $\log_2|4 - 5x| < 2,$ then x $\in$

A. $\left(0, \frac{5}{4}\right)$

B. $\left(0, \frac{4}{5}\right)$

C. $\left(0, \frac{5}{8}\right)$

D. $\left(\frac{4}{5}, \frac{8}{5}\right)$

Answer: B::D

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Wb Jee Previous Years Questions

1. The number of solutions of the equation

$\frac{1}{2}\log_{\sqrt{3}}\left(\frac{x+1}{x+5}\right) + \log_9 (x+5)^2 = 1$ is

A. 0

B. 1

C. 2

D. infinite

Answer: B

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2. If a, b and c are positive numbers in a GP, then the roots of the quadratic equation $(\log_e a)^2 - (2\log_e b)x + (\log_e c) = 0$ are

A. -1 and $\frac{\log_e c}{\log_e a}$

B. 1 and $-\frac{\log_e c}{\log_e a}$

C. 1 and $\log_a c$

D. -1 and $\log_c a$

Answer: C

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3. The number of digits in 20^{301} (given $\log_{10} 2 = 0.3010$) is

A. 602

B. 301

C. 392

D. 391

Answer: C

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4. The solution of the equation

$\log_{101} \log_7 \left(\sqrt{x+7} + \sqrt{x}\right) = 0$ is

A. 3

B. 7

C. 9

D. 49

Answer: C

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5. If $\log_{0.2}(x-1) > \log_{0.04}(x+5)$ then

A. $-1 < x < 4$

B. $2 < x < 3$

C. $1 < x < 4$

D. $1 < x < 3$

Answer: C

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

B. $b = \sqrt{ac}$

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

D. none of (a),(b) , (c) are correct

Answer: C

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7. If $\log_{0.3}(x-1) < \log_{0.09}(x-1)$, then x lies in the interval

A. $(2, \infty)$

B. (1,2)

C. (-2,-1)

D. none of these

Answer: A

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8. If $(\log_5 x)(\log_x 3x)(\log_{3x} y) = \log_x x^3$ then y equals

A. 125

B. 25

C. $5/3$

D. 243

Answer: A

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9. If x + $\log_{10}(1 + 2^x) = x \log_{10} 5 + \log_{10} 6,$ then the value of x is

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

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

C. 1

D. 2

Answer: C

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10. If $\log_2 6 + \frac{1}{2x} = \log_2\left(2^{1/x} + 8\right)$, then the values of x are

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

B. $\frac{1}{4}, \frac{1}{2}$

C. $-\frac{1}{4}, \frac{1}{2}$

D. $\frac{1}{3}, -\frac{1}{2}$

Answer: B

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