NDA 1 2025

LIVE

MATHS

LOGARITHMS

CLASS 2

NAVJYOTI SIR

Crack
EXAMS

01 Oct 2024 Live Classes Schedule

8:00AM	01 OCTOBER 2024 DAILY CURRENT AFFAIRS	RUBY MA'AM
9:00AM	01 OCTOBER 2024 DAILY DEFENCE UPDATES	DIVYANSHU SIR

NDA 1 2025 LIVE CLASSES

11:30AM	GK - BIOGEOGRAPHY	RUBY MA'AM
1:00PM	BIOLOGY - BASIS OF LIFE	SHIVANGI MA'AM
4:00PM	MATHS - LOGARITHMS - CLASS 2	NAVJYOTI SIR

CDS 1 2025 LIVE CLASSES

11:30AM	GK - BIOGEOGRAPHY	RUBY MA'AM
1:00PM	BIOLOGY - BASIS OF LIFE	SHIVANGI MA'AM
2:30PM	MATHS - SI & CI - CLASS 1	NAVJYOTI SIR

AFCAT 1 2025 LIVE CLASSES

10:00AM	REASONING - BLOOD RELATIONS	RUBY MA'AM
2:30PM	MATHS - SI & CI - CLASS 1	NAVJYOTI SIR
4:00PM	STATIC GK - SPORTS PERSONALITIES	DIVYANSHU SIR

SSBCrack EXAMS

If $f(x) = \log_{10}(1 + x)$, then what is $4f(4) + 5f(1) - \log_{10} 2$ equal to ?

(PYQ – 2019 – I)

A. 0

B. 1

C. 2

D. 4 ✓

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

$f(4) = \log_{10}(1+4) = \log_{10} 5$

$4\log_{10}5 + 5(\log_{10}2) - \log_{10}2$

$4\log_{10}5 + 4\log_{10}2$

$= 4(\log_{10}5 + \log_{10}2)$

$= 4(\log_{10}(5\times2))$

$= 4\log_{10}10 = 4(1) = 4$

$\log_m a + \log_m b = \log_m(a\times b)$

If $f(x) = \log_{10}(1 + x)$, then what is $4f(4) + 5f(1) - \log_{10} 2$ equal to ?

(PYQ – 2019 – I)

A. 0

B. 1

C. 2

D. 4

What is the value of $\log_7 \log_7 \sqrt{7\sqrt{7\sqrt{7}}}$? (PYQ – 2018)

A. $3\log_2 7$

B. $1 - 3\log_2 7$

C. $1 - 3\log_7 2$

D. $\frac{7}{8}$

$\sqrt{7\sqrt{7\times 7^{\frac{1}{2}}}} = \sqrt{7\sqrt{7^{1+\frac{1}{2}}}} = \sqrt{7\sqrt{7^{\frac{3}{2}}}}$

$= \sqrt{7\left(7^{3/2}\right)^{\frac{1}{2}}}$

$= \sqrt{7\cdot 7^{3/4}} = \sqrt{7^{1+\frac{3}{4}}}$

$= \sqrt{7^{\frac{7}{4}}}$

$= \left(7^{7/4}\right)^{\frac{1}{2}}$

$= 7^{7/8}$

$(a^m)^n = a^{m\times n}$

$\log_7 \log_7 7^{7/8}$

$= \log_7\left(\frac{7}{8}\right) = \log_7(7) - \log_7(8)$

$= 1 - \log_7(2^3) = 1 - 3\log_7 2$

What is the value of $\log_7 \log_7 \sqrt{7\sqrt{7\sqrt{7}}}$?

A. $3\log_2 7$

B. $1 - 3\log_2 7$

C. $1 - 3\log_7 2$

D. $\frac{7}{8}$

If $(0.2)^x = 2$ and $\log_{10} 2 = 0.3010$, then what is the value of x to the nearest tenth ?

A. – 10.0

B. – 0.5

C. – 0.4 ✓

D. – 0.2

$(0.2)^x = 2$

Taking log both sides,

$\log_{10}(0.2)^x = \log_{10} 2$

$x \log(0.2) = \log_{10} 2$

$x = \left(\frac{\log_{10} 2}{\log_{10} 0.2}\right) = \frac{0.3010}{\log_{10}\left(\frac{2}{10}\right)} = \frac{0.3010}{\log_{10} 2 - \log_{10} 10} = \frac{0.3010}{0.3010 - 1}$

$$\frac{0.3010}{0.3010 - 1} = -\frac{0.3010}{0.6989} \simeq -\frac{0.3}{0.7} \simeq -\frac{3}{7}$$

$$= -0.42$$

If $(0.2)^x = 2$ and $\log_{10} 2 = 0.3010$, then what is the value of x to the nearest tenth ?

A. – 10.0

B. – 0.5

C. – 0.4

D. – 0.2

If n = (2017)!, then what is $\frac{1}{\log_2 n}+\frac{1}{\log_3 n}+\frac{1}{\log_4 n}+\ldots+\frac{1}{\log_{2017} n}$ equal to ?

(PYQ – 2018)

A. 0

B. 1

C. n / 2

D. n

$4! = 4\times3\times2\times1$ (factorial)

$7! = 7\times6\times5\times4\times3\times2\times1$

$\log_a m = \frac{1}{\log_m a}$

$\frac{1}{\log_2 n}+\frac{1}{\log_3 n}+\ldots+\frac{1}{\log_{2017} n}$

$= \log_n 2 + \log_n 3 + \ldots \log_n 2017$

$= \log_n (2\times3\times4\times\ldots 2017)$

$\log_m a + \log_m b + \ldots \log_m z$

$= \log_m (a\cdot b\cdot c\ldots z)$

$$= \log_n (2 \times 3 \times 4 \ldots 2017)$$

$$= \log_n (1 \times 2 \times 3 \times 4 \ldots 2017)$$

$$= \log_n (2017!)$$

$$= \log_{2017!} (2017!) = 1$$

$$2017! = 2017 \times 2016 \ldots \times 1$$

If n = (2017)!, then what is $\frac{1}{\log_2 n} + \frac{1}{\log_3 n} + \frac{1}{\log_4 n} + \ldots + \frac{1}{\log_{2017} n}$ equal to ?

A. 0

B. 1

C. n / 2

D. n

If $x + \log_{15}(1 + 3^x) = x\log_{15} 5 + \log_{15} 12$, where x is an integer, then what is x equal to ?

A. – 3

B. 2

C. 1

D. 3

$$x + \log_{15}(1+3^x) = x\log_{15} 5 + \log_{15} 12$$

$$x = \log_{15}(12 \cdot 5^x) - \log_{15}(1+3^x)$$

$$x = \log_{15}\left(\frac{12 \times 5^x}{1+3^x}\right)$$

A.) $-3 \Rightarrow$ RHS $= \alpha$

B.) $\underline{2} \Rightarrow$ RHS $= \frac{12 \times 5^2}{1+3^2} = \frac{12 \times 25}{10} = \alpha$

$$x = \log_{15}\left(\frac{12 \times 5^{x}}{1+3^{x}}\right)$$

$\frac{12 \times 5^{x}}{1+3^{x}} \rightarrow 15^{1}$

(c) $1 \longrightarrow$

$$\frac{12 \times 5}{1+3} = \frac{60}{4} = 15 = 15^{1}$$

If $x + \log_{15}(1 + 3^x) = x\log_{15} 5 + \log_{15} 12$, where x is an integer, then what is x equal to ?

A. -3

B. 2

C. 1

D. 3

What is the value of $\dfrac{\log_{\sqrt{\alpha\beta}}(H)}{\log_{\sqrt{\alpha\beta\gamma}}(H)}$?

(a) $\log_{\alpha\beta}(\alpha)$
(b) $\log_{\alpha\beta\gamma}(\alpha\beta)$
(c) $\log_{\alpha\beta}(\alpha\beta\gamma)$
(d) $\log_{\alpha\beta}(\beta)$

✓

$$\frac{\left[\log_{\sqrt{\alpha\beta}}(H)\right]}{\left[\log_{\sqrt{\alpha\beta\gamma}}(H)\right]} = \frac{\dfrac{1}{\log_H(\sqrt{\alpha\beta})}}{\dfrac{1}{\log_H(\sqrt{\alpha\beta\gamma})}} = \frac{\log_H\sqrt{\alpha\beta\gamma}}{\log_H\sqrt{\alpha\beta}}$$

$$= \frac{\log_H(\alpha\beta\gamma)^{1/2}}{\log_H(\alpha\beta)^{1/2}} = \frac{\frac{1}{2}\log_H(\alpha\beta\gamma)}{\frac{1}{2}\log_H(\alpha\beta)}$$

$$\frac{\log_H(\alpha\beta\gamma)}{\log_H(\alpha\beta)} = \frac{\log_H(\alpha\beta\gamma)}{\log_H(\alpha\beta)} = \log_{\alpha\beta}(\alpha\beta\gamma)$$

$$\left[\log_b a = \frac{\log_m a}{\log_m b}\right]$$

What is the value of $\dfrac{\log_{\sqrt{\alpha\beta}}(H)}{\log_{\sqrt{\alpha\beta\gamma}}(H)}$?

(a) $\log_{\alpha\beta}(\alpha)$
(b) $\log_{\alpha\beta\gamma}(\alpha\beta)$
(c) $\log_{\alpha\beta}(\alpha\beta\gamma)$
(d) $\log_{\alpha\beta}(\beta)$

ANSWER : C

If $\log_{10} x - \log_{10} \sqrt{x} = 2 \log_x 10$, then a possible value of x is given by

(a) 10 (b) 1/100 ✓

(c) 1/1000 (d) None of these

$\log_{10}\left(\frac{x}{\sqrt{x}}\right) = 2 \times \frac{1}{\log_{10} x}$

$\log_{10}(\sqrt{x}) \times \log_{10} x = 2$

(a) $10 \rightarrow LHS = \frac{1}{2} \times 1 = \frac{1}{2}$ ✗

(b) $\frac{1}{100} = \frac{1}{10^2}$ (10^{-2}) $LHS = (-1)(-2) = 2$ ✓

If $\log_{10} x - \log_{10} \sqrt{x} = 2 \log_x 10$, then a possible value of x is given by

(a) 10
(b) 1/100
(c) 1/1000
(d) None of these

ANSWER : B

(PYQ – 2020 – I)

What is the value of

$$\frac{1}{10}\log_5 1024 - \log_5 10 + \frac{1}{5}\log_5 3125?$$

(a) 0 (b) 1 (c) 2 (d) 3

$$\frac{1}{10}\log_5(2^{10}) - \log_5 10 + \frac{1}{5}\log_5(5^5)$$

$$\log_m(a^b) = b\log_m a$$

$$\frac{1}{10}\times 10(\log_5 2) - \log_5 10 + \frac{1}{5}\times 5(\log_5 5)$$

$$\frac{\log_5 2 - \log_5 10 + \log_5 5}{\log_5\left(\frac{2}{10}\right) + 1} = \log_5\left(\frac{1}{5}\right) + 1 = \log_5(5^{-1}) + 1 = -1 + 1 = 0$$

If $x = \log_c(ab)$, $y = \log_a(bc)$, $z = \log_b(ca)$, then which of the following is correct? **(PYQ – 2020 – I)**

(a) $xyz = 1$

(b) $x + y + z = 1$

(c) $(1+x)^{-1} + (1+y)^{-1} + (1+z)^{-1} = 1$

(d) $(1+x)^{-2} + (1+y)^{-2} + (1+z)^{-2} = 1$

$x = \log_c(ab)$

$y = \log_a(bc)$

$z = \log_b(ca)$

(c) $1 + x = 1 + \log_c(ab)$

$= \log_c c + \log_c(ab) = \log_c(abc)$

$1 + y = \log_a(abc)$

$1 + z = \log_b(abc)$

$\frac{1}{\log_c(abc)} + \frac{1}{\log_a(abc)} + \frac{1}{\log_b(abc)}$

$= \log_{abc} c + \log_{abc} a + \log_{abc} b$

$= \log_{abc}(abc) = 1$

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SETS-RELATION FUNCTION

CLASS 1

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