NDA 1 2025

LIVE

MATHS

DERIVATIVES

MCQS

NAVJYOTI SIR

Crack
EXAMS

13 Feb 2025 Live Classes Schedule

9:00AM	13 FEBRUARY 2025 DAILY DEFENCE UPDATES	DIVYANSHU SIR
10:00AM	13 FEBRUARY 2025 DAILY CURRENT AFFAIRS	RUBY MA'AM

SSB INTERVIEW LIVE CLASSES

9:30AM	OVERVIEW OF GROUP TASKS	ANURADHA MA'AM

AFCAT 1 2025 LIVE CLASSES

3:00PM	STATIC GK - POLITY	DIVYANSHU SIR
4:30PM	ENGLISH - COMPREHENSION - CLASS 1	ANURADHA MA'AM

NDA 1 2025 LIVE CLASSES

10:00AM	MATHS - DERIVATIVES	NAVJYOTI SIR
11:30AM	PHYSICAL GEOGRAPHY - CLASS 1	RUBY MA'AM
1:00PM	BIOLOGY - CLASS 4	SHIVANGI MA'AM
4:30PM	ENGLISH - COMPREHENSION - CLASS 1	ANURADHA MA'AM

CDS 1 2025 LIVE CLASSES

11:30AM	PHYSICAL GEOGRAPHY - CLASS 1	RUBY MA'AM
1:00PM	BIOLOGY - CLASS 4	SHIVANGI MA'AM
4:30PM	ENGLISH - COMPREHENSION - CLASS 1	ANURADHA MA'AM
5:30PM	MATHS - TRIGONOMETRY - CLASS 1	NAVJYOTI SIR

PYQ – 2024 - I

Let $f(x)$ and $g(x)$ be two functions such that

$g(x) = x - \frac{1}{x}$ and $f \circ g(x) = x^3 - \frac{1}{x^3}$.

What is $g[f(x) - 3x]$ equal to ?

(a) $x^3 - \frac{1}{x^3}$

(b) $x^3 + \frac{1}{x^3}$

(c) $x^2 - \frac{1}{x^2}$

(d) $x^2 + \frac{1}{x^2}$

$$f[g(x)] = x^3 - \frac{1}{x^3}$$

$$f[g(x)] = \left(x - \frac{1}{x}\right)^3 + 3\left(x - \frac{1}{x}\right)$$

$$f(x) = x^3 + 3x$$

$$g[f(x) - 3x] = g[x^3 + 3x - 3x] = g(x^3) = x^3 - \frac{1}{x^3}$$

PYQ – 2024 - I

Let $f(x)$ and $g(x)$ be two functions such that

$g(x) = x - \frac{1}{x}$ and $f \circ g(x) = x^3 - \frac{1}{x^3}$.

What is $g[f(x) - 3x]$ equal to ?

(a) $x^3 - \frac{1}{x^3}$

(b) $x^3 + \frac{1}{x^3}$

(c) $x^2 - \frac{1}{x^2}$

(d) $x^2 + \frac{1}{x^2}$

Ans: (a)

PYQ – 2024 - I

Let $f(x)$ and $g(x)$ be two functions such that

$g(x) = x - \frac{1}{x}$ and $f \circ g(x) = x^3 - \frac{1}{x^3}$.

What is $f''(x)$ equal to ?

(a) $-\frac{2}{x^3}$

(b) $2x + \frac{2}{x^3}$

(c) $6x + 3$

(d) $6x$

$f(x) = x^3 + 3x$

$f'(x) = 3x^2 + 3$

$f''(x) = 6x$

PYQ – 2024 - I

Let $f(x)$ and $g(x)$ be two functions such that

$g(x) = x - \frac{1}{x}$ and $f \circ g(x) = x^3 - \frac{1}{x^3}$.

What is $f''(x)$ equal to ?

(a) $-\frac{2}{x^3}$

(b) $2x + \frac{2}{x^3}$

(c) $6x + 3$

(d) $6x$

Ans: (d)

Q) What is the derivative of $\tan^{-1} x$ with respect to $\cot^{-1} x$?

(a) -1

(b) 1

(c) $\frac{1}{x^2+1}$

(d) $\frac{x}{x^2+1}$

$u = \tan^{-1} x \quad ; \quad v = \cot^{-1} x$

$$\frac{du}{dv} = \frac{\left(\frac{du}{dx}\right)}{\left(\frac{dv}{dx}\right)} = \frac{\frac{1}{1+x^2}}{\frac{-1}{1+x^2}} = -1$$

Q) What is the derivative of $\tan^{-1} x$ with respect to $\cot^{-1} x$?

(a) -1

(b) 1

(c) $\frac{1}{x^2+1}$

(d) $\frac{x}{x^2+1}$

Ans: (a)

Q) What is the derivative of $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$ with respect to $\tan^{-1} x$?

(a) 0 (b) $\frac{1}{2}$

(c) 1 (d) x

Let $x = \tan\theta \Rightarrow \theta = \tan^{-1} x$

$$\tan^{-1}\left(\frac{\sqrt{1+\tan^2\theta}-1}{\tan\theta}\right) = \tan^{-1}\left(\frac{\sec\theta - 1}{\tan\theta}\right)$$

$$= \tan^{-1}\left(\frac{1-\cos\theta}{\sin\theta}\right)$$

$$= \tan^{-1}\left(\frac{1-\cos\theta}{\sin\theta}\right)$$

$$= \tan^{-1}\left(\frac{2\sin^2\theta/2}{2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}\right)$$

$$= \tan^{-1}\left(\tan\frac{\theta}{2}\right) = \frac{\theta}{2} = \frac{1}{2}\left(\tan^{-1}x\right)$$

w.r.t. $\tan^{-1}x$ → $\frac{1}{2}$

Q) What is the derivative of $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$ with respect to $\tan^{-1} x$?

(a) 0

(b) $\frac{1}{2}$

(c) 1

(d) x

Ans: (b)

Q) Consider the curve $x = a(\cos\theta + \theta\sin\theta)$ and $y = a(\sin\theta - \theta\cos\theta)$.

What is $\frac{dy}{dx}$ equal to ?

(a) $\tan\theta$ (b) $\cot\theta$

(c) $\sin 2\theta$ (d) $\cos 2\theta$

$$\frac{dy}{dx} = \frac{\frac{dy}{d\theta}}{\frac{dx}{d\theta}} = \frac{a(\cos\theta + \theta\sin\theta - \cos\theta)}{a(-\sin\theta + \theta\cos\theta + \sin\theta)} = \tan\theta$$

Q) Consider the curve $x = a(\cos\theta + \theta\sin\theta)$ and $y = a(\sin\theta - \theta\cos\theta)$.

What is $\frac{dy}{dx}$ equal to ?

(a) $\tan\theta$ (b) $\cot\theta$

(c) $\sin 2\theta$ (d) $\cos 2\theta$

Ans: (a)

Q) What is $\frac{d^2y}{dx^2}$ equal to ?

(a) $\sec^2\theta$ (b) $-\operatorname{cosec}^2\theta$

(c) $\frac{\sec^3\theta}{a\theta}$ (d) None of these

$$\frac{d^2y}{dx^2} = \frac{d}{dx}\left(\frac{dy}{dx}\right) = \frac{d}{dx}(\tan\theta) = \frac{d}{d\theta}(\tan\theta)\cdot\left(\frac{d\theta}{dx}\right)$$

$$= \sec^2\theta \times \frac{1}{a\theta\cos\theta} = \frac{1}{a\theta\cos^3\theta} = \underbrace{\left(\frac{\sec^3\theta}{a\theta}\right)}$$

Q) What is $\frac{d^2y}{dx^2}$ equal to ?

(a) $\sec^2 \theta$

(b) $-\operatorname{cosec}^2 \theta$

(c) $\frac{\sec^3 \theta}{a\theta}$

(d) None of these

Ans: (c)

Q) If $y = \sec(\tan^{-1} x)$, then $\frac{dy}{dx}$ at $x = 1$ is equal to

(a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{2}$ (c) 1 (d) $\sqrt{2}$

$$\frac{dy}{dx} = \sec(\tan^{-1} x)\tan(\tan^{-1} x)\cdot\left(\frac{1}{1+x^2}\right)$$

$x = 1$

$$= \sqrt{2} \times 1 \cdot \frac{1}{1+1} = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$$

Q) If $y = \sec(\tan^{-1} x)$, then $\frac{dy}{dx}$ at $x = 1$ is equal to

(a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{2}$ (c) 1 (d) $\sqrt{2}$

Ans: (a)

Q) What is the derivative of

$(\log_{\tan x} \cot x)\,(\log_{\cot x} \tan x)^{-1}$ at $x = \frac{\pi}{4}$?

(a) -1 (b) 0

(c) 1 (d) $\frac{1}{2}$

$$\log_a b = \frac{\log_m b}{\log_m a}$$

$$\frac{\log \cot x}{\log \tan x} \times \frac{\log \cot x}{\log \tan x} = \left(\frac{\log \cot x}{\log \tan x}\right)^2$$

$$= (-1)^2 = 1$$

$$\frac{\log \cot x}{\log\left(\frac{1}{\cot x}\right)}$$

$$\log(1) - \log(\cot x)$$

$$\frac{\log \cot x}{0 - \log \cot x} = -1$$

$$\log\left(\frac{a}{b}\right) = \log a - \log b$$

$$y = 1$$

$$\frac{dy}{dx} = 0$$

Q) What is the derivative of

$$(\log_{\tan x} \cot x)\,(\log_{\cot x} \tan x)^{-1} \text{ at } x = \frac{\pi}{4}?$$

(a) -1 (b) 0

(c) 1 (d) $\frac{1}{2}$

Ans: (b)

Q) If $f(1)=1$, $f'(1)=3$, then the derivative of $f(f(f(x)))+(f(x))^2$ at $x=1$ is

(a) 12 (b) 9 (c) 15 (d) 33

$$f'(f(f(x)) \cdot f'(f(x)) \cdot f'(x) + 2f(x)f'(x)$$

$$f'(f(f(1)) \cdot f'(f(1)) \cdot f'(1) + 2f(1)f'(1)$$

$$3 \times 3 \times 3 + 2(1)(3)$$

$$27 + 6 = 33$$

Q) If $f(1)=1$, $f'(1)=3$, then the derivative of $f(f(f(x)))+(f(x))^2$ at $x=1$ is

(a) 12 (b) 9 (c) 15 (d) 33

Ans: (d)

Q) What is the derivative of $\cos^{-1}\left(\frac{2\cos x + 3\sin x}{\sqrt{13}}\right)$?

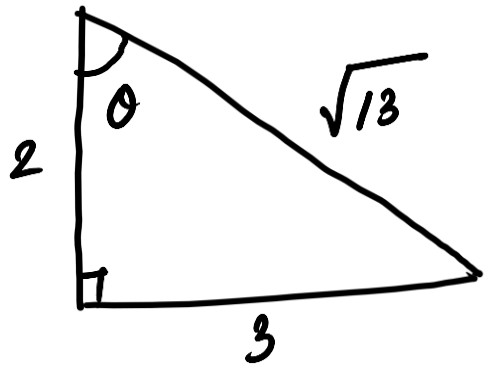
(a) $\frac{1}{\sqrt{1-x^2}}$ (b) $-\frac{1}{\sqrt{1-x^2}}$

(c) 0 (d) 1

$$\cos^{-1}\left(\frac{2}{\sqrt{13}}\cos x + \frac{3}{\sqrt{13}}\sin x\right)$$

$$\cos^{-1}\left(\cos\theta\cos x + \sin\theta\sin x\right)$$

$$\cos^{-1}\left(\cos(\theta - x)\right) \quad / \quad \cos^{-1}\left(\cos(x-\theta)\right)$$



$$\cos\theta = \frac{2}{\sqrt{13}} \; ; \quad \sin\theta = \frac{3}{\sqrt{13}}$$

$$\theta = \cos^{-1}\left(\frac{2}{\sqrt{13}}\right)$$

$\cos^{-1}\left(\cos(\theta - x)\right) \quad / \quad \cos^{-1}\left(\cos(x - \theta)\right)$

$\theta - x$ $\qquad$ $x - \theta$

$\cos^{-1}\left(\frac{2}{\sqrt{13}}\right) - x \qquad x - \cos^{-1}\left(\frac{2}{\sqrt{13}}\right)$

$0 - 1 = -1$ $\qquad$ 1

Q) What is the derivative of $\cos^{-1}\left(\frac{2\cos x + 3\sin x}{\sqrt{13}}\right)$?

(a) $\frac{1}{\sqrt{1-x^2}}$

(b) $-\frac{1}{\sqrt{1-x^2}}$

(c) 0

(d) 1

Ans: (d)

Q) If $f(x) = \cot^{-1}\left(\frac{x^x - x^{-x}}{2}\right)$, then $f'(1)$ is equal to

(a) -1 (b) 1

(c) $\log 2$ (d) $-\log 2$

$$f(x) = \tan^{-1}\left(\frac{2}{x^x - x^{-x}}\right)$$

$$\tan(2\theta) = \frac{2\tan\theta}{1-\tan^2\theta}$$

$$2\tan^{-1}\theta = \frac{2\theta}{1-\theta^2}$$

$$\frac{2}{x^x - x^{-x}} = \frac{\frac{2}{x^x}}{\frac{x^x}{x^x} - \frac{x^{-x}}{x^x}} = \frac{2x^{-x}}{1-(x^{-x})^2}$$

$\theta = x^{-x}$

$-$

$$\tan^{-1}\left(\frac{2x^{-x}}{1-(x^{-x})^2}\right) = 2\tan^{-1}(x^{-x})$$

Let $z = x^{-x}$

$$\log z = -x\log x$$

$$\frac{1}{z}\frac{dz}{dx} = -x\left(\frac{1}{x}\right) + \log x(-1)$$

$$\frac{dz}{dx} = x^{-x}(-1-\log x)$$

$$f'(x) = 2\left(\frac{1}{1+(x^{-2x})}\right)\cdot(x^{-x})(-1-\log x)$$

$x = 1$

$$f'(1) = 2\left(\frac{1}{1+1}\right)(1)(-1-0) = -1$$

Q) If $f(x) = \cot^{-1}\left(\frac{x^x - x^{-x}}{2}\right)$, then $f'(1)$ is equal to

(a) -1 (b) 1

(c) $\log 2$ (d) $-\log 2$

Ans: (a)

Q) What is the derivative of $f(x) = x|x|$?

(a) $|x|+x$ (b) $2x$

(c) $2|x|$ (d) $-2|x|$

u v

$$f'(x) = |x| \cdot 1 + x \cdot \frac{|x|}{x}$$

$$f'(x) = 2|x|$$

$$\begin{cases} y = |x| \\ \dfrac{dy}{dx} = \dfrac{|x|}{x} \end{cases}$$

Q) What is the derivative of $f(x) = x|x|$?

(a) $|x|+x$ (b) $2x$

(c) $2|x|$ (d) $-2|x|$

Ans: (c)

Q) If y is a function of x and $\log(x+y) = 2xy$, then the value of $y'(0)$ is

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

$$\frac{1}{x+y}\left(1+\frac{dy}{dx}\right) = 2y + 2x\frac{dy}{dx}$$

$$y'(x) = \frac{dy}{dx}$$

$$\frac{dy}{dx} = \frac{2y - \frac{1}{x+y}}{\frac{1}{x+y} - 2x}$$

$$\log(0+y) = 2(0)y$$

$$\log y = 0$$

$$y = 1$$

$$\frac{dy}{dx} = \frac{2y - \frac{1}{x+y}}{\frac{1}{x+y} - 2x}$$

$x = 0 \; ; \; y = 1,$

$$\frac{dy}{dx} = \frac{2(1) - \frac{1}{0+1}}{\frac{1}{0+1} - 2(0)} = \frac{2-1}{1-0} = 1$$

Q) If y is a function of x and $\log(x + y) = 2xy$, then the value of $y'(0)$ is

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

Ans: (a)

Q) If $x^2 + y^2 = 1$, then

(a) $yy'' - 2(y')^2 + 1 = 0$ (b) $yy'' + (y')^2 + 1 = 0$

(c) $yy'' + (y')^2 - 1 = 0$ (d) $yy'' + 2(y')^2 + 1 = 0$

$$2x + 2yy' = 0$$

$$2 + 2\left((y')^2 + yy''\right) = 0$$

$$1 + (y')^2 + yy'' = 0$$

$$yy'' + (y')^2 + 1 = 0$$

Q) If $x^2 + y^2 = 1$, then

(a) $yy'' - 2(y')^2 + 1 = 0$

(b) $yy'' + (y')^2 + 1 = 0$

(c) $yy'' + (y')^2 - 1 = 0$

(d) $yy'' + 2(y')^2 + 1 = 0$

Ans: (b)

Q) What is the derivative of $\tan^{-1}\left(\frac{\sqrt{x}-x}{1+x^{3/2}}\right)$ at $x=1$?

(a) $-\frac{1}{4}$ (b) $\frac{1}{2}$

(c) $\frac{3}{2}$ (d) 1

$\tan^{-1}A - \tan^{-1}B = \tan^{-1}\left(\frac{A-B}{1+AB}\right)$

$y = \tan^{-1}(\sqrt{x}) - \tan^{-1}x$

$\frac{dy}{dx} = \frac{1}{1+x} \times \frac{1}{2\sqrt{x}} - \frac{1}{1+x^2}$

$x = 1,$

$= \frac{1}{2} \times \frac{1}{2} - \frac{1}{2}$

$= \frac{1}{4} - \frac{1}{2} = -\frac{1}{4}$

Q) What is the derivative of $\tan^{-1}\left(\frac{\sqrt{x}-x}{1+x^{3/2}}\right)$ at $x=1$?

(a) $-\frac{1}{4}$

(b) $\frac{1}{2}$

(c) $\frac{3}{2}$

(d) 1

Ans: (a)

Q) The derivative of $y = a^{x \log_a \sin x}$ is equal to

(a) $\log \sin x + x \tan x$

(b) $\log \sin x + x \cot x$

(c) $y \log (\sin x \, e^{x \cot x})$

(d) $y \log (\sin x \, e^{x \tan x})$

Q) The derivative of $y = a^{x \log_a \sin x}$ is equal to

(a) $\log \sin x + x \tan x$

(b) $\log \sin x + x \cot x$

(c) $y \log (\sin x \, e^{x \cot x})$

(d) $y \log (\sin x \, e^{x \tan x})$

Ans: (c)

Q) What is the derivative of $2^{(\sin x)^2}$ with respect to $\sin x$?

(a) $\sin x \, 2^{(\sin x)^2} \ln 4$

(b) $2 \sin x \, 2^{(\sin x)^2} \ln 4$

(c) $\ln (\sin x) \, 2^{(\sin x)^2}$

(d) $2 \sin x \cos x \, 2^{(\sin x)^2}$

Q) What is the derivative of $2^{(\sin x)^2}$ with respect to $\sin x$?

(a) $\sin x\, 2^{(\sin x)^2} \ln 4$

(b) $2 \sin x\, 2^{(\sin x)^2} \ln 4$

(c) $\ln (\sin x)\, 2^{(\sin x)^2}$

(d) $2 \sin x \cos x\, 2^{(\sin x)^2}$

Ans: (a)

Q) The derivative of $\ln(x+\sin x)$ with respect to $(x+\cos x)$ is

(a) $\dfrac{1+\cos x}{(x+\sin x)(1-\sin x)}$

(b) $\dfrac{1-\cos x}{(x+\sin x)(1+\sin x)}$

(c) $\dfrac{1-\cos x}{(x-\sin x)(1+\cos x)}$

(d) $\dfrac{1+\cos x}{(x-\sin x)(1-\cos x)}$

Q) The derivative of $\ln(x+\sin x)$ with respect to $(x+\cos x)$ is

(a) $\dfrac{1+\cos x}{(x+\sin x)(1-\sin x)}$ (b) $\dfrac{1-\cos x}{(x+\sin x)(1+\sin x)}$

(c) $\dfrac{1-\cos x}{(x-\sin x)(1+\cos x)}$ (d) $\dfrac{1+\cos x}{(x-\sin x)(1-\cos x)}$

Ans: (a)

Q) If $y = \cot^{-1}\left[\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right]$, where $0 < x < \frac{\pi}{2}$, then

$\frac{dy}{dx}$ is equal to

(a) $\frac{1}{2}$ (b) 2

(c) $\sin x + \cos x$ (d) $\sin x - \cos x$

Q) If $y = \cot^{-1}\left[\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right]$, where $0 < x < \frac{\pi}{2}$, then

$\frac{dy}{dx}$ is equal to

(a) $\frac{1}{2}$ (b) 2

(c) $\sin x + \cos x$ (d) $\sin x - \cos x$

Ans: (a)

Q) If $y = \tan^{-1}\left(\frac{5-2\tan\sqrt{x}}{2+5\tan\sqrt{x}}\right)$, then what is $\frac{dy}{dx}$ equal to?

(a) $-\frac{1}{2\sqrt{x}}$

(b) 1

(c) -1

(d) $\frac{1}{2\sqrt{x}}$

Q) If $y = \tan^{-1}\left(\frac{5-2\tan\sqrt{x}}{2+5\tan\sqrt{x}}\right)$, then what is $\frac{dy}{dx}$ equal to?

(a) $-\frac{1}{2\sqrt{x}}$

(b) 1

(c) -1

(d) $\frac{1}{2\sqrt{x}}$

Ans: (a)

Q) If $y = \sin(ax + b)$, then what is $\frac{d^2y}{dx^2}$ at $x = -\frac{b}{a}$, where a, b are constants and $a \neq 0$?

(a) 0 (b) –1

(c) $\sin(a - b)$ (d) $\sin(a + b)$

Q) If $y = \sin(ax + b)$, then what is $\frac{d^2y}{dx^2}$ at $x = -\frac{b}{a}$, where a, b are constants and $a \neq 0$?

(a) 0 (b) –1

(c) $\sin(a - b)$ (d) $\sin(a + b)$

Ans: (a)

Q) If $f(x)=\sqrt{x+\sqrt{x+\sqrt{x+\sqrt{\ldots\infty}}}}$, then what is the value of $f'(x)$?

(a) $\dfrac{1}{1-2f(x)}$

(b) $\dfrac{1}{2f(x)-1}$

(c) $\dfrac{1}{1+2f(x)}$

(d) $\dfrac{1}{2+f(x)}$

Q) If $f(x)=\sqrt{x+\sqrt{x+\sqrt{x+\sqrt{\ldots\infty}}}}$, then what is the value of $f'(x)$?

(a) $\dfrac{1}{1-2f(x)}$

(b) $\dfrac{1}{2f(x)-1}$

(c) $\dfrac{1}{1+2f(x)}$

(d) $\dfrac{1}{2+f(x)}$

Ans: (b)

Q) If $y = \tan^{-1}\left(\frac{a\cos x - b\sin x}{b\cos x + a\sin x}\right)$, then $\frac{dy}{dx}$ is equal to

(a) 2 (b) -1 (c) $\frac{a}{b}$ (d) $\frac{b}{a}$

Q) If $y = \tan^{-1}\left(\frac{a\cos x - b\sin x}{b\cos x + a\sin x}\right)$, then $\frac{dy}{dx}$ is equal to

(a) 2 (b) -1 (c) $\frac{a}{b}$ (d) $\frac{b}{a}$

Ans: (b)

Q) What is the derivative of $\sin^{-1}\left(\frac{t}{\sqrt{1+t^2}}\right)$ *wrt* $\cos^{-1}\left(\frac{1}{\sqrt{1+t^2}}\right)$?

(a) 1
(b) –1
(c) 2
(d) –2

Q) What is the derivative of $\sin^{-1}\left(\frac{t}{\sqrt{1+t^2}}\right)$ *wrt* $\cos^{-1}\left(\frac{1}{\sqrt{1+t^2}}\right)$?

(a) 1
(b) –1
(c) 2
(d) –2

Ans: (a)

Q) If $y = \log_{10} x + \log_x 10 + \log_x x + \log_{10} 10$ then what is $\left(\frac{dy}{dx}\right)_{x=10}$ equal to?

(a) 10
(b) 2
(c) 1
(d) 0

Q) If $y = \log_{10} x + \log_x 10 + \log_x x + \log_{10} 10$ then what is $\left(\frac{dy}{dx}\right)_{x=10}$ equal to?

(a) 10
(b) 2
(c) 1
(d) 0

Ans: (d)

Q) If $y = (\cos x)^{(\cos x)^{(\cos x)^{\infty}}}$, then $\frac{dy}{dx}$ is equal to

(a) $-\frac{y^2 \tan x}{1 - y \ln(\cos x)}$

(b) $\frac{y^2 \tan x}{1 + y \ln(\cos x)}$

(c) $\frac{y^2 \tan x}{1 - y \ln(\sin x)}$

(d) $\frac{y^2 \sin x}{1 + y \ln(\sin x)}$

Q) If $y = (\cos x)^{(\cos x)^{(\cos x)^{\infty}}}$, then $\frac{dy}{dx}$ is equal to

(a) $-\frac{y^2 \tan x}{1 - y \ln(\cos x)}$

(b) $\frac{y^2 \tan x}{1 + y \ln(\cos x)}$

(c) $\frac{y^2 \tan x}{1 - y \ln(\sin x)}$

(d) $\frac{y^2 \sin x}{1 + y \ln(\sin x)}$

Ans: (a)

Q) If $u = \sin^{-1}(x - y), x = 3t, y = 4t^3$, then what is the derivative of u *wrt* t?

(a) $3(1 - t^2)$

(b) $3(1 - t^2)^{-\frac{1}{2}}$

(c) $5(1 - t^2)^{\frac{1}{2}}$

(d) $5(1 - t^2)$

Q) If $u = \sin^{-1}(x - y), x = 3t, y = 4t^3$, then what is the derivative of u *wrt* t?

(a) $3(1 - t^2)$

(b) $3(1 - t^2)^{-\frac{1}{2}}$

(c) $5(1 - t^2)^{\frac{1}{2}}$

(d) $5(1 - t^2)$

Ans: (b)

Q) If $x^2 + y^2 = t + \frac{1}{t}$, $x^4 + y^4 = t^2 + \frac{1}{t^2}$, then what is the value of $-x^3 y \frac{dy}{dx}$?

(a) $\frac{1}{4}$

(b) $\frac{1}{3}$

(c) $\frac{1}{2}$

(d) 1

Q) If $x^2 + y^2 = t + \frac{1}{t}$, $x^4 + y^4 = t^2 + \frac{1}{t^2}$, then what is the value of $-x^3 y \frac{dy}{dx}$?

(a) $\frac{1}{4}$

(b) $\frac{1}{3}$

(c) $\frac{1}{2}$

(d) 1

Ans: (d)

Q) If $f(x) = e^x$ and $g(x) = \log x$, then what is the value of $(gof)'(x)$?

(a) 0

(b) 1

(c) e

(d) None of these

Q) If $f(x) = e^x$ and $g(x) = \log x$, then what is the value of $(gof)'(x)$?

(a) 0 (b) 1

(c) e (d) None of these

Ans: (b)

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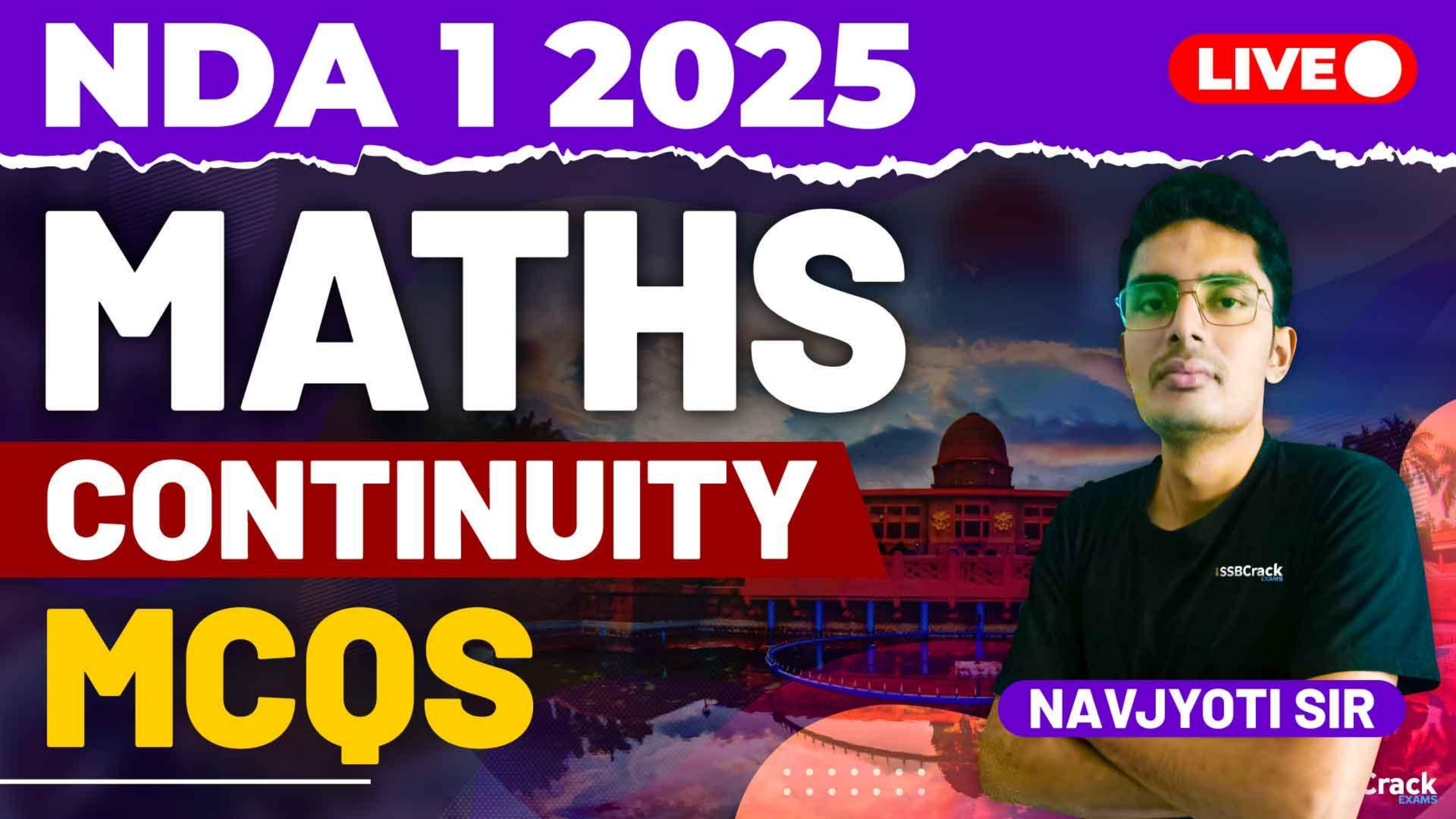
LIVE

MATHS

CONTINUITY

MCQS



NAVJYOTI SIR

Crack
EXAMS