Some Important Questions

2020 (ODD)

① The domain of the function $\sqrt{x^2-7x+12}$

(a) $(3,4)$

(b) $\mathbb{R}-(3,4)$

(c) $\mathbb{R}$

(d) None of these

② The range of the function $\sqrt{16-x^2}$

(a) $(0,4)$

(b) $]-4,4[$

(c) $[-4,4]$

(d) None of these

③ If $f(x) = x^2 - \frac{1}{x^2}$, then $f(x) + f\left(\frac{1}{x}\right) = ?$

(a) 0

(b) 1

(c) 2

(d) None of these

④ $\lim_{x \to 0} \frac{\tan x^\circ}{x} = ?$

(a) $\frac{180^\circ}{\pi}$

(b) $\frac{\pi}{180^\circ}$

(c) πx

(d) None of these

(5) $\lim_{x \to 0} \frac{x^2 - 3x + 2}{3x^2 + x - 3} = ?$

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

(b) 3

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

(d) None of these

(6) If $y = \tan^{-1}\left(\frac{\sin x}{1+\cos x}\right)$, then $\frac{dy}{dx} = ?$

(a) $1/2$

(b) 2

(c) 1

(d) None of these

(7) The differential co-efficient of $\tan(x^2+3)$ With respect to (w.r.t.) x is :

(a) $x \sec^2(x+3)$

(b) $2x \sec^2(x+3)$

(c) $\sec^2(x+3)$

(d) None of these

(8) The differential co-efficient of $\tan x$ w.r.t. $\cot x$ is

(a) $\cot^2 x$

(b) $\tan^2 x$

(c) $-\tan^2 x$

(d) None

⑨ If $x = a\cos\theta$, $y = a\sin\theta$, then $\frac{dy}{dx} = ?$

(a) $\cot\theta$

(b) $-\cot\theta$

(c) $\sin\theta$

(d) None

(10) If $y = x + x^2 + \frac{x^3}{\lfloor 2} + \frac{x^4}{\lfloor 3} + \cdots$, then $\frac{dy}{dx} = ?$

(a) $x e^x$

(b) $e^x (x+1)$

(c) $e^x (x+1)$

(d) None

(11) The slope of the tangent to the curve

$x = t^2 - 3t - 8$, $y = 2t^2 - 2t - 5$ at the point $t = 2$

(a) $22/7$

(b) $6/7$

(c) -6

(d) None

2020 (EVen)

(12) The range of the function $f(x) = \cos x - \sin x$

(a) $[-2, 2]$

(b) $(-1, 1)$

(c) $[-\sqrt{2}, \sqrt{2}]$

(d) None

(13) $\lim_{z \to 0} \frac{1 - \sqrt{1-z}}{z} = ?$

(a) $1/2$

(b) $-1/2$

(c) 2

(d) None

(14) $\lim_{x \to 1} \frac{x^n - 1}{x - 1} = ?$

(a) 1

(b) $-n$

(c) n

(d) None

(15) $\lim_{\theta \to 0} \frac{\sin 5\theta}{\sin 2\theta} = ?$

(a) $1/5$

(b) $2/5$

(c) $5/2$

(d) None

(16) $\lim_{x \to 0} \frac{\tan^{-1} x}{x} = ?$

(a) 0

(b) -1

(c) 1

(d) None

(17) Differential co-efficient of $\operatorname{cosec} x$ w.r.t. x

(a) $\operatorname{cosec} x \cdot \cot x$

(b) $-\operatorname{cosec} x \cdot \cot x$

(c) $\sec^2 x$

(d) None

(18) Differential co-efficient of $\tan^{-1}x$ w.r.t. x

(a) $1/1+x^2$

(b) $-1/1+x^2$

(c) $1/1-x^2$

(d) None

(19) Differential co-efficient of $e^{\sin x}$ w.r.t. x

(a) $\cos x\, e^{\sin x}$

(b) $\sin x \cdot e^{\cos x}$

(c) $\dfrac{e^{\sin x}}{\cos x}$

(d) None

(20) Differential co-efficient of $\sqrt{\tan x}$ w.r.t. x

(a) $\sec^2 x / \sqrt{\tan x}$

(b) $\operatorname{cosec}^2 x / \sqrt{\tan x}$

(c) $\sec^2 x / 2\sqrt{\tan x}$

(d) None

(21) Differential co-efficient of $\sin(\log x)$ w.r.t. x

(a) $\cos(\log x)/x$

(b) $-\cos(\log x)/x$

(c) $\cos x/\log x$

(d) None

(22) If $x = a\cos^2\theta$, $y = a\sin^2\theta$, then $\frac{dy}{dx} = ?$

(a) 1

(b) -1

(c) 2

(d) None

(23) If $y = x^3 + 4x^2 + 5$, then $\frac{d^2y}{dx^2}$ at $x = 0$ is

(a) 7

(b) -8

(c) 8

(d) None

(24) The equation of tangent to the curve $y^2 = 6x$ at the point $(2, -3)$ is :

(a) $x + y - 1 = 0$

(b) $x + y + 1 = 0$

(c) $x - y + 1 = 0$

(d) None of these.

(25) If $f(x) = \log\left(\frac{1+x}{1-x}\right)$, then $f\left(\frac{2x}{1+x^2}\right) = ?$

2019 (EVen)

(a) $2f(x)$

(b) $[f(x)]^2$

(c) $3f(x)$

(d) None of these

(26) $\lim_{x \to a} \frac{x^n - a^n}{x - a} = ?$

(a) $n a^{n+1}$

(b) $n a^{n-1}$

(c) $n a^{n-2}$

(d) None of these

(27) $\lim_{x \to 0} \dfrac{\sqrt[3]{1+x} - 1}{x} = ?$

(a) 3

(b) $-1/3$

(c) $1/3$

(d) None

(28) $\lim_{x \to \infty} \frac{\sin x}{x} = ?$

(a) 1

(b) -1

(c) 0

(d) None

(29) $\lim_{\theta \to 0} \frac{\tan 2\theta}{\sin 5\theta} = ?$

(a) $2/5$

(b) $5/2$

(c) $-2/3$

(d) None

(30) Differential co-efficient of $\sec x$ w.r.t. x

(a) $-\sec x \cdot \tan x$

(b) $\operatorname{cosec}^2 x$

(c) $\sec x \cdot \tan x$

(d) None of these

(31) Differential co-efficient of $\cot^{-1} x$ w.r.t. x

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

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

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

(d) None of these

(32) Differential co-efficient of e^{ax} w.r.t. x

(a) e^{ax}/a

(b) $-a e^{ax}$

(c) $a e^{ax}$

(d) None of these.

(33) Differential co-efficient of $\sqrt{\cot x}$ w.r.t. x

(a) $-\operatorname{cosec}^2 x / 2\sqrt{\cot x}$

(b) $\operatorname{cosec}^2 x / 2\sqrt{\cot x}$

(c) $\sec^2 x / 2\sqrt{\cot x}$

(d) None of these

(37) Differential co-efficient of $\log(\log x)$ w.r.t. x

(a) $\frac{-1}{x \log x}$

(b) $x \log x$

(c) $\frac{1}{x \log x}$

(d) None of these

(35) Differential co-efficient of $\sec x$ w.r.t.. $\tan x$

(a) $\cos x$

(b) $\tan x$

(c) $\sin x$

(d) None of these

(36) If $x = ae^{t}$, $y = be^{-t}$, then $\frac{dy}{dx} = ?$

(a) $-\frac{b}{a}e^{-2t}$

(b) $-\frac{a}{b}e^{-2t}$

(c) $\frac{a}{b}e^{-2t}$

(d) None of these

(37) If $y = 4x^3 - 2x^2 - 2x + 7$, then the value of $\frac{d^2y}{dx^2}$ at the point $x = 2$ is :

(a) -44

(b) 44

(c) 42

(d) None

(38) The slope of the curve $y^2 = 4x$ at point $(1,1)$

(a) 1

(b) 2

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

(d) None of these

2019 (ODD)

(39) The domain of the function $\frac{1}{\sqrt{(1-x)(x-2)}}$ is

(a) $]0,2[$

(b) $]1,2[$

(c) $[1,2]$

(d) None of these

(40) $\lim_{x \to 0} \frac{\tan 5x}{\sin 3x} = ?$

(a) $3/5$

(b) $5/3$

(c) 1

(d) None of these

(41) The differential co-efficient of $\tan^{-1}\sqrt{\frac{1-\cos x}{1+\cos x}}$ w.r.t. x is

(a) 2

(b) 1/2

(c) 1

(d) None of these

(42) The differential co-efficient of $\log(\cot x)$ w.r.t. x

(a) $\sec x + \operatorname{cosec} x$

(b) $\sec x \cdot \operatorname{cosec} x$

(c) $-\sec x \cdot \operatorname{cosec} x$

(d) None of these

(43) The differential co-efficient of $\tan x$ w.r.t. $\sin x$

(a) $\sec^2 x$

(b) $-\sec^2 x$

(c) $\cos^2 x$

(d) None of these

(44) If $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$, then $\frac{dy}{dx} = ?$

(a) $\tan\theta$

(b) $\cot\theta$

(c) $\tan\frac{\theta}{2}$

(d) None of these

2018 (EVEN)

(45) The domain of the function $\sqrt{(x-2)(x-3)}$

(a) $\{x \geq 3 \text{ or } x \leq 2\}$

(b) $\{x \leq 1 \text{ or } x \geq 2\}$

(c) $\{x < 0 \text{ or } x > 5\}$

(d) None of these

(46) The range of the function $y = \frac{x}{1+x^2}$ is

(a) $\left[\frac{-1}{2}, \frac{1}{2}\right]$

(b) $\left[\frac{-1}{2}, 0\right]$

(c) $\left[0, \frac{-1}{2}\right]$

(d) None of these

(47) If $f(y) = \log y$, then $f(y) + f\left(\frac{1}{y}\right) = ?$

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

(b) y

(c) 0

(d) None of these

(48) $\lim_{x \to a} \frac{x^4 - a^4}{x - a} = ?$

(a) $3a^4$

(b) $4a^3$

(c) $4a^4$

(d) None of these

(49) $\lim_{x \to 0} \frac{\sin x^\circ}{x} = ?$

(a) $\frac{180}{\pi}$

(b) $\frac{-\pi}{180}$

(c) $\frac{\pi}{180}$

(d) None of these

(50) If $x = a\cos^3\theta$, $y = a\sin^3\theta$, then $\frac{dy}{dx} = ?$

(a) $\tan\theta$

(b) $\cot\theta$

(c) $-\tan\theta$

(d) None of these.

(51) slope of the curve $y^2 = 2x^2 + x + 1$ at point $(1,2)$

(a) $4/5$

(b) $5/4$

(c) $\sqrt{5}/4$

(d) None of these

Thank You !

Have a Nice Day !

"Learn Mathematics for Golden Future."

- Dr. Mritunjay kumar Singh
M.Sc., MPhil-PhD