INTERNATIONAL INDIAN SCHOOL BURAIDAH
MATHS-XII/WS Continuity and Differentiability-2025-26

1-If the function f defined as $\mathbf{f(x)} = \begin{cases} \frac{x^2-9}{x-3}, & x \neq 3 \\ k, & x = 3 \end{cases}$ is continuous at x=3 , find the value of k. Ans : k=6 (CBSE-2020)

2- Find the value of k if the function $\mathbf{f(x)} = \begin{cases} \frac{Sin5x}{3x} + cosx, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous at x=0

Ans : k= 8/3 (CBSE-2017)

3-Find the value of k if the function $\mathbf{f(x)} = \begin{cases} \frac{kx}{|x|}, & x < 0 \\ k, & x \geq 0 \end{cases}$ is continuous at x=0

Ans : k= -3 (CBSE-2017)

4- Find the value of λ if the function $\mathbf{f(x)} = \begin{cases} \frac{sin^2 \lambda x}{x^2} & x \neq 0 \\ 1, & x = 0 \end{cases}$ is continuous at x=0

Ans : $\lambda = \pm 1$ (CBSE-2023)

5- If $\mathbf{f(x)} = \begin{cases} x^2, & if \ x \geq 1 \\ x, & if \ x < 1 \end{cases}$ then show that f is not differentiable at x =1 (CBSE-2023)

6- Differentiate $sin^2(\sqrt{x})$ with respect to x (CBSE-2020)

7- If y = $2\sqrt{sec(e^{2x})}$ then find $\frac{dy}{dx}$ (CBSE-2020)

8- If y = Cosec(Cot$\sqrt{x}$) then find $\frac{dy}{dx}$ (CBSE-2020)

9- If $y = 5e^{7x} + 6e^{-7x}$, $show\ that\ \frac{d^2y}{dx^2} = 49y$ (CBSE-2019)

10- If y = $(x + \sqrt{x^2-1})^2$, then show that $(x^2-1)(\frac{dy}{dx})^2 = 4y^2$ (CBSE-2023)

11- If $(x^2 + y^2)^2 = xy \ \ then \ \ find \ \ \frac{dy}{dx}$ (CBSE-2023)

12- If $y = x^{\frac{1}{x}}$, then find $\frac{dy}{dx}$ at x =1 (CBSE-2023)

13- If $x = a\ sin2t$, $y = a(\ cos2t + log\ tant\ )$, $then\ find\ \frac{dy}{dx}$ (CBSE-2023)

14- If x = at^2 , $y = 2at$, *then find* $\frac{d^2y}{dx^2}$ (CBSE-2020)

15- If f(x) = $\sqrt{tan\sqrt{x}}$, then find $f'(\frac{\pi^2}{16})$ (CBSE-2020)

16- If $y = \sqrt{ax + b}$, prove that y $(\frac{d^2y}{dx^2})$ + $(\frac{dy}{dx})^2$ = 0 (CBSE-2023)

17- Differentiate $\tan^{-1}\frac{3x - x^3}{1 - 3x^2}$ w.r.t $\tan^{-1}\frac{x}{\sqrt{1-x^2}}$ (CBSE-2019)

18- If $(\cos x)^y = (\cos y)^x$ then find $\frac{dy}{dx}$ (CBSE-2012,2024)

19- If $\sqrt{1 - x^2} + \sqrt{1 - y^2}$ = a(x – y) then show that $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$

(CBSE-2009,19,24)

20- If $y = (\tan^{-1} x)^2$, show that $(x^2 + 1)^2 y_2 + 2x(x^2 + 1)y_1 = 2$ (CBSE-2012)

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX