

MM: 15 **Class Test XII A** Time: 30 min

Q 1-3 carry 1 mark, Q 4-6 carry 4 marks.

1. Write the points of discontinuity of $f(x) = [x]$.
2. If $y = \cos^{-1}(4x^3 - 3x)$, write value of dy/dx .
3. Is Rolle's Theorem applicable to $f(x) = x^2 - 4$ for $x \in [1, 2]$?
4. If $\log(\sqrt{x^2 + y^2}) = \tan^{-1} \frac{y}{x}$, prove that $\frac{dy}{dx} = \frac{x+y}{x-y}$.

OR

If $x\sqrt{1+y} + y\sqrt{1+x} = 0$ for $-1 < x < 1$ prove that $\frac{dy}{dx} = -\frac{1}{(1+x)^2}$

MM: 15 **Class Test XII B** Time: 30 min

Q 1-3 carry 1 mark, Q 4-6 carry 4 marks.

1. Write the point(s) of discontinuity of $f(x) = |3x - 8|$.
2. If $y = \sin^{-1}(2x\sqrt{1-x^2})$, write value of dy/dx .
3. Is Rolle's theorem applicable to $f(x) = [x]$ on $[-1, 1]$?
4. If $y\sqrt{x^2+1} = \log(\sqrt{x^2+1}-x)$, show $(x^2+1)\frac{dy}{dx} + xy + 1 = 0$.

OR

If $\cos y = x \cos(a+y)$; $\cos a \neq \pm 1$, prove that $\frac{dy}{dx} = \cos^2(a+y)$

MM: 15 **Class Test XII C** Time: 30 min

Q 1-3 carry 1 mark, Q 4-6 carry 4 marks.

1. Justify is $\sin|x^2|$ continuous or not?
2. If $y = \cos^{-1}\left(\frac{2x}{1+x^2}\right)$, write value of dy/dx .
3. Is Rolle's Theorem applicable to $f(x) = [x]$ on $[-1, 1]$? Justify.
4. If $y \log x = x - y$, prove that $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$.

OR

If $x\sqrt{1+y} + y\sqrt{1+x} = 0$ for $-1 < x < 1$ prove that $\frac{dy}{dx} = -\frac{1}{(1+x)^2}$

MM: 20 **Class Test XII A** Time: 30 min

Each Question Carries 5 marks

Q1. The surface area of a spherical bubble is increasing at the rate of $2 \text{ cm}^2 / \text{sec}$. Find the rate at which the volume of the bubble is increasing at the instant its radius is 6 cm.

Q2. Prove that $y = \frac{4 \sin \theta}{(2 + \cos \theta)} - \theta$ is an increasing function of θ in $\left[0, \frac{\pi}{2}\right]$.

Q3. Find the equation of the tangent to the curve $y = \sqrt{3x-2}$ which is parallel to the $4x - 2y + 5 = 0$.

Q4. Using differentials, find the approximate value of $(81.5)^{1/4}$.