

FIRST ASSESMENT TEST, AUGUST 2020

MATHEMATICS

CLASS: XII

TIME: 30 MIN

MARKS: 20

Choose the correct option for the following questions from 1 to 4

1. If $\sqrt{x} + \sqrt{y} = a$, then $\frac{dy}{dx}$ is

- i) $\sqrt{\frac{x}{y}}$ ii) $-\sqrt{\frac{y}{x}}$ iii) $\frac{x^2}{x+y}$ iv) $\frac{x^2}{y^2}$

2. The range of x for which the function $4x^3 - 6x^2 - 72x + 30$ is decreasing is

- i) $[-2,3]$ ii) $(-\infty,-2)$ iii) $(-2,3)$ iv) $(-\infty,-2) \cup (3,\infty)$

3. $\lim_{x \rightarrow \frac{\pi}{2}} (x \tan x - \frac{\pi}{2} \sec x)$ is

- i) $\frac{1}{2}$ ii) 1 iii) 0 iv) -1

4. The slope of the curve $y = x^3 - x$ at $x = 2$ is

- i) 10 ii) 11 iii) -10 iv) 8 (4×1=4)

5. If $y = (\sin^{-1} x)^2$ Prove that $(1 - x^2) \frac{d^2y}{dx^2} - x \frac{dy}{dx} = 2$ (4)

6. Verify Rolle's Theorem for the function $y = \cos x - 1$ where $x \in [0, 2\pi]$ (4)

7. Find the equation of the tangent to the curve $y = x^3 + 2x - 4$ which are perpendicular to $x + 14y + 3 = 0$ (4)

8. An edge of a variable cube is increasing at a rate of 3cm per second. How fast is the volume of the cube increasing when the edge is 10cm long? (4)