Progressive Education Society's
Modern College of Arts, Science and Commerce (Autonomous),
Shivajinagar, Pune - 5

Department of Mathematics
FYBSc(Semester I)19ScMatU103

Based on Differential Calculus
Subject : Mathematics Practical-I (19ScMatU103)
Practical Incharge: Rima Ahuja
Practical 9:Differentiation

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1. Let $f(x) = \begin{cases} x+2, & 0 \leq x \leq 1 \\ 2x^2+1, & 1 < x \leq 2. \end{cases}$
   Show that $f(x)$ is continuous but not differentiable at $x = 1$.
2. Let $f : \mathbb{R} \to \mathbb{R}$ such that $f(x) = |x| + |x+1|$.
   Discuss the differentiability of $f(x)$ on $\mathbb{R}$ and find $f'(x)$.
3. Find $f'(x)$ using definition, when $f(x) = \sqrt{x}, x > 0$.
4. Let $f(x) = |x-7|$. Discuss the differentiability of $f(x)$ at $x = 7$.
5. Let $f(x) = |x-3|$. Discuss the differentiability of $f(x)$ at $x = 2$.