

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 12:Miscellaneous

1. Assuming the validity of expansion prove that $\log(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots$; $-1 < x \leq 1$.
2. Use Taylor's theorem express the polynomial $2x^3 + 7x^2 + x - 6$ in powers of $(x - 2)$.
3. Show that $\frac{x}{1+x} < \log(1+x) < x$; $x > 0$
4. Evaluate $\lim_{x \rightarrow 1} x^{\frac{1}{1-x}}$.
5. Evaluate $\lim_{x \rightarrow 3} \left[\frac{1}{x} - \frac{1}{\tan x} \right]$.