

MALABAR CHRISTIAN COLLEGE, CALICUT
First Semester Internal Examination, September 2026

Minor Course in Mathematics
CALCULUS OF SINGLE VARIABLE
MAT1MN102

Time: 1 Hr

Max Marks: 35

Name:	Marks Scored	Section A		Total Marks
		Section B		
		Section C		
Class:				

SECTION A

(Each question carries 3 marks, Max marks for section – 7)

1. Find $\lim_{x \rightarrow 3} \frac{x^2 - 5x + 6}{x - 3}$.

2. Does the function

$$f(x) = \begin{cases} \sin x, & \text{if } x \leq \frac{\pi}{2} \\ x^2, & \text{if } x > \frac{\pi}{2} \end{cases}$$

continuous at $\frac{\pi}{2}$? Why?

3. Using the definition of differentiation, find $\frac{d}{dx}[x^2]$.

SECTION B

(Each question carries 6 marks, Max marks for section – 18)

4. Discuss the continuity of the function

$$f(x) = \frac{x+2}{x^2-4}$$

5. Find the value of $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ using numerical evidence.

6. Find:

(a) $\lim_{x \rightarrow \infty} \frac{x^2 + 2}{3x - 6}$

(b) $\lim_{x \rightarrow -\infty} \frac{x^2 + 2}{3x - 6}$

7. State and prove the Intermediate Value Theorem, and use it to show that $x^3 - x - 1 = 0$ has a root in $[1, 2]$.