

MATHEMATICS EXAMINATION

Total Points: 100 | Questions: 7 | Date: November 17, 2025

Answer all questions. Time allowed: 3 hours.

Question 1

Solve the quadratic equation $x^2 - 5x + 6 = 0$.

Question 2

Evaluate the integral $\int_0^1 x^2 dx$.

Question 3

Find the limit $\lim_{x \rightarrow 0} \frac{\sin(x)}{x}$.

Question 4

What is the derivative of $f(x) = x^3 + 2x^2 - x + 5$?

A. $3x^2 + 4x - 1$

B. $3x^2 + 4x + 1$

C. $x^4 + 2x^3 - x^2 + 5x$

D. $3x^2 - 4x - 1$

Question 5

A particle moves according to the equation $s(t) = 3t^2 - 2t + 1$, where

s is displacement in meters and

t is time in seconds. Find the velocity at

$t = 2$ seconds.

Question 6

Given the system of equations:

$$2x + y = 7$$

$$x - y = 2$$

Solve for x and y .

Question 7

Prove that $\frac{d}{dx}[\sin(x)] = \cos(x)$ using the definition of derivative.