



The University of Fiji

(An Entity of Arya Pratinidhi Sabha of Fiji)



SCHOOL OF SCIENCE AND TECHNOLOGY

Semester 1, 2026

FINAL EXAMINATION PAPER

MTHF11: FOUNDATION MATHEMATICS I

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. The paper consists of four (4) questions. All questions are **compulsory** to answer.
6. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
7. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
1	Basic Mathematics and Algebra	25	45 minutes
2	Equations	25	45 minutes
3	Graphs and Trigonometry	25	45 minutes
4	Limits, Continuity and Derivatives	25	45 minutes
	TOTAL	100	180 Minutes

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Registration Certificate Number (RGN0020/11)*

(a) Solve

$$|x - 2| = 10$$

(2 marks)

(b) Simplify

(i) $(3x^2 + 5x - 2) + (2x^2 - 3x + 7)$

(ii) $(6x^2 - 4x + 9) - (2x^2 + x - 5)$

(1 + 1 = 2 marks)

(c) Expand and simplify

$$(2x - 3)(x + 5)$$

(2 marks)

(d) Given $A = \begin{bmatrix} 5 & 2 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -5 \\ 2 & 6 \end{bmatrix}$, find:

(i) $2A$

(ii) $2A + 4B$

(iii) AB

(1 + 2 + 2 = 5 marks)

(e) Solve for x, y and z if $\begin{bmatrix} 2x + y & 4 \\ z & 0 \end{bmatrix} = \begin{bmatrix} 6 & 4 \\ 1 & x - y \end{bmatrix}$

(3 marks)

(e) Simplify $\frac{1}{-1 + \sqrt{3}}$

(3 marks)

(f) Express

$$\frac{6x}{(x - 2)(x + 1)}$$

using partial fraction decomposition.

(3 marks)

(g) Apply laws of indices to simplify:

(i) $2x^2 \times 3x^4$

(ii) $12x^7 \div 4x^3$

(iii) $(-3x^5)^2$

(iv) $\frac{4(x^3)^2}{12x^2}$

(v) $\frac{32x^{15}y^8}{16x^2y^3}$

(1 + 1 + 1 + 1 + 1 = 5 marks)

(a) Solve

(i)

$$5x + 1 = 11$$

(ii)

$$\frac{x}{3} + \frac{x}{5} = \frac{16}{15}$$

(2 + 3 = 5 marks)

(b) Solve

$$\frac{3x+1}{4} = \frac{x-3}{2}$$

(3 marks)

(c) Solve the simultaneous equations using substitution method.

$$2x + y = 9$$

$$x - y = 3$$

(3 marks)

(d) Find the point(s) of intersection between the curve $y = x^2 - 4$ and the line $y = x + 2$.

(4 marks)

(e) Solve $x^2 - 5x + 6 = 0$ using the quadratic formula.

(4 marks)

(f) Factorize the following:

(i) $25 - x^2$

(ii) $x^2 - 3x$

(2 + 2 = 4 marks)

(g) Factorize the following expression by grouping.

$$ax + ay + bx + by$$

(2 marks)

(a) A linear function is given by $4y - 2x = 6$.

(i) Find the coordinate of the x intercept.

(ii) Find the coordinate of the y intercept.

(iii) Sketch the linear function.

(1 + 1 + 2 = 4 marks)

(b) Given $f(x) = (x - 2)(x + 1)$

(i) Find the x and y intercepts.

(ii) State the equation of the line of symmetry.

(iii) Determine the coordinate of the turning point.

(iv) Sketch the graph $f(x)$.

(3 + 2 + 2 + 3 = 11 marks)

(c) Let $g(x) = (x - 2)(x + 1)(x + 4)$.

(i) Find the coordinate(s) of the x intercept.

(ii) Find the coordinate(s) of the y intercept.

(iii) Sketch the function $g(x)$. Label all the intercepts clearly.

(2 + 1 + 3 = 6 marks)

(d) A function is given as $f(x) = 2^x$.

(i) Find the coordinate of the y-intercept.

(ii) Sketch the graph of $f(x)$ and label it clearly.

(iii) State the equation of $g(x)$, the inverse of $f(x)$.

(1 + 2 + 1 = 4 marks)

(a) Determine whether the following function $g(x)$ is continuous at $x = 1$.

$$g(x) = \begin{cases} 3x + x^2 & \text{if } x \neq 1 \\ 4, & \text{if } x = 1 \end{cases}$$

(3 marks)

(b) Use Product Rule/ Quotient Rule to differentiate the following.

(i) $y = x^2(2x + 1)$

(ii) $y = \frac{3x}{5x^2+1}$

(3 + 3 = 6 marks)

(c) Evaluate:

(i) $\lim_{x \rightarrow -3} \frac{x^2+5x+6}{x+3}$

(ii) $\lim_{x \rightarrow 3} \frac{9-x^2}{3-x}$

(iii) $\lim_{x \rightarrow 3} \frac{3x-x^2}{3-x}$

(3 + 3 + 3 = 9 marks)

(d) A function is given by $f(x) = \frac{1}{3}x^3 + \frac{1}{2}x^2 - 6x$.

(i) Differentiate to find $f'(x)$.

(ii) Determine the x value(s) of the turning point(s) of $f(x)$.

(iii) Determine the coordinate(s) of the turning point.

(2 + 2 + 3 = 7 marks)

THE END