

2024-2025 S3
1st TERM UT1
MATH

2024-2025
S3 First Term Uniform Test 1

MATHEMATICS

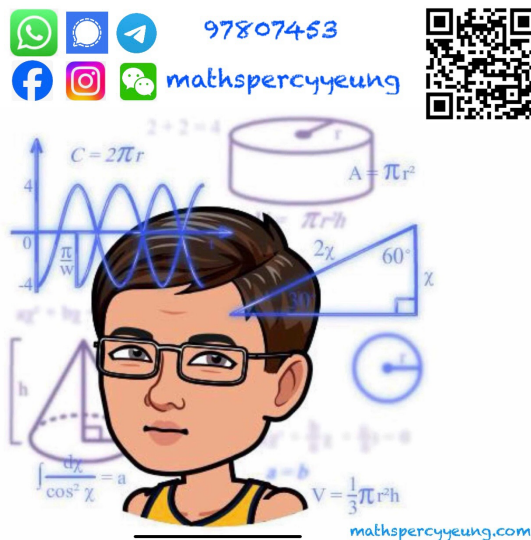
Question–Answer Book

28th October, 2024
8:15 am – 9:15 am (1 hour)

This paper must be answered in English

INSTRUCTIONS

- Write your name, class and class number in the spaces provided on this cover.
- Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question – Answer Book.
- Unless otherwise specified, all working must be clearly shown and numerical answers should be either exact or correct to 3 significant figures.
- The diagrams in this paper are not necessarily drawn to scale.



Sections	Marks
A (1 – 3)	
A (4 – 12)	
A Total	/50
B Total	/20
TOTAL	/70

Section A (50 marks)

1. The volume of a glass of orange juice is 250 mL, correct to the nearest 5 mL. Find the percentage error of the measurement. (3 marks)

2. Factorize

(a) $100 - a^2$,

(b) $10b + ab + 100 - a^2$.

(3 marks)

3. (a) Make t the subject of the formula $v = \frac{2u}{1+t}$.

(b) If $u = 3$ and $v = -1$, find the value of t .

(4 marks)

4. Simplify the following and express the answers with positive indices.

(a) $(x^0 y^3)^2 \times (2x^4 y^{-5})^3$

(b) $(ab^{-2}) \div \left(\frac{b}{a^0}\right)^{-1}$

(6 marks)

5. Factorize

(a) $m^2 + 5m + 4$,

(b) $12q^2 - 2pq - 4p^2$.

(3 marks)

8. (a) Express 11001_2 in the expanded form.
- (b) Write down the place value of the underlined digit in $6\underline{2}71_{10}$.
- (c) Convert 85_{10} into a binary number by short division.

(4 marks)

[illegible]

9. (a) Solve the inequality $3x + 8 > 7$ and represent the solution graphically.
- (b) Solve the inequality $-\frac{5+3t}{2} \leq -3t + 4$ and represent the solution graphically
- (c) Write down the largest prime number satisfying the inequality in (b).

(7 marks)

[illegible]

- (4 marks)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

- (4 marks)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

12. Consider the salaries tax rates as follows.

Net chargeable income	Tax rates
On the first \$50 000	2%
On the next \$50 000	6%
On the next \$50 000	10%
On the next \$50 000	14%
Remainder	17%

The annual income of Anson is \$750 000. If he has an allowance of \$138 000, find

- (a) his net chargeable income,
- (b) his salaries tax payable.

(5 marks)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Section B (20 marks)

13. Johnny deposited \$ P in Bank A on simple interest at the beginning of 2010. The interest rate is 3% p.a. for the first year and 4% p.a. for subsequent years. He obtained a total interest of \$880 at the beginning of 2013.
- (a) Find the value of P . (3 marks)
- (b) At the beginning of which year did Johnny obtain a total interest of \$2 160? (4 marks)
- (c) If Johnny deposits \$ P in Bank B at an interest rate of 3% p.a., compounded half-yearly at the beginning of 2010, find the total interest he obtained at the beginning of 2017. (Give your answer correct to the nearest dollar.) (3 marks)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Lined paper template with horizontal ruling lines.

14. (a) (i) Factorize $49m^2 - 144n^2$.

- (ii) Factorize $14m^2 + 46mn - 120n^2$.

(3 marks)

- (b) Hence, or otherwise, factorize

$$14(2x-2y)^2 + 46(2x-2y)(x-2y) - 120(x-2y)^2.$$

(3 marks)

- (c) Hence, or otherwise, simplify

$$\frac{12x+60y}{14(2x-2y)^2+46(2x-2y)(x-2y)-120(x-2y)^2} \div \frac{3}{49x^2-144y^2}.$$

(4 marks)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Lined paper template with horizontal ruling lines.

END OF PAPER