2023-2024 S1
1st TERM UT1
MATH

2023 – 2024
S1 First Term Uniform Test 1

MATHEMATICS

Question–Answer Book

10th November, 2023
9:30 am – 10:30 am (1 hour)

This paper must be answered in English

INSTRUCTIONS

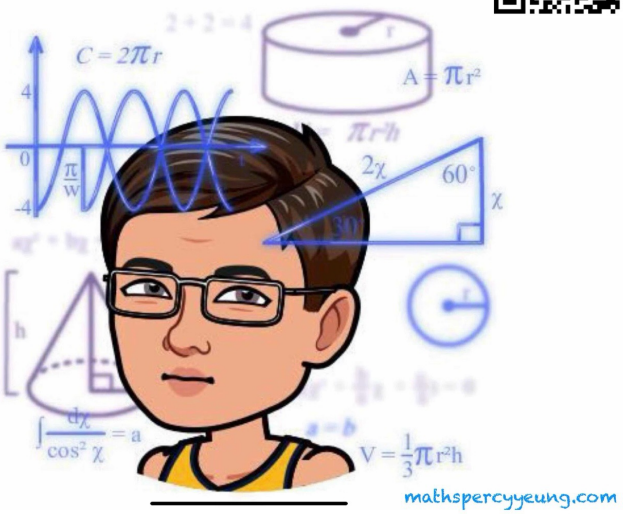
1. Write your name, class and class number in the spaces provided on this cover.

2. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question – Answer Book.

3. Unless otherwise specified, all working must be clearly shown.

4. The diagrams in this paper are not necessarily drawn to scale.

5. NO calculator is allowed.



Sections	Marks
A Total	**/50**
B Total	**/20**
TOTAL	**/70**

Section A (50 marks)

1. Write down the answers clearly. No working step is required. (7 marks)

Question	*Answer*
(a) Write down the H.C.F. of 4 and 7.	
(b) Write down all the positive integers that are not greater than 4.	
(c) Write down the constant term of $5xy-\frac{9}{k}+4x^2-8+6z$.	
(d) Write down the largest 3-digit number which is divisible by 4.	
(e) Express 'Divide x by y and then subtract the quotient from the square of z' by using an algebraic expression.	
(f) Write down the next term of the sequence $1,-\frac{1}{2},\frac{1}{4},-\frac{1}{8},...$	
(g) What is the largest prime factor of 45?	

2. Consider the formula $S=2a(k+4)^2$. Find the value of S when $a=-\frac{9}{2}$ and $k=6$. (3 marks)

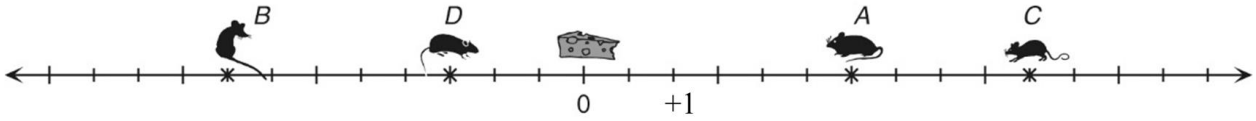
3. There are 1800 employees in a company. $\frac{4}{9}$ of the employees are female and $\frac{3}{10}$ of the male employees are wearing a watch. Find the number of male employees wearing a watch.

(3 marks)

4. **(a)** Use index notation to express 108 as a product of prime factors.
(b) Find the L.C.M. of 6, $2^2 \times 5$ and 108 by prime factorization.
(c) Find the H.C.F. and L.C.M. of 24, 26 and 52 by short division.

(8 marks)

5. There are 4 mice (*A*, *B*, *C* and *D*) and their locations are represented by points on the number line below. It is given that a piece of cheese is placed at '0' of the number line.



(a) Use directed numbers to represent the locations of the four mice.

(b) Assume that all of the 4 mice are running at the same speed towards the cheese at the same time. Which mouse can reach the cheese second? Explain your answer.

(6 marks)

6. Simplify the following expressions**.**

(a) $3a+4b-2b+7a+5$

(b) $(y+y+y)\times 4y^2$

(c) $(5x-15x)\div 5\times 2+x$ (7 marks)

7. Evaluate the following expressions**.**

(a) $1-[(+7)+(-13)]$

(b) $\dfrac{14+(-4^2)}{20-(-5)^2}$

(c) $1+[(\dfrac{-7}{10}+\dfrac{6}{5})+(0.4)(0.25)]$ (8 marks)

8. Solve the following equations**.**

(a) $2n-2=-1-3n+4$

(b) $\dfrac{4-3w}{4}-6=1$

(c) $\dfrac{4(u-1)}{2}=5-(u+1)$ (8 marks)

Section B (20 marks)

9. **(a)** Find the values of the following expressions.

(i) $(-1)+(-6)$

(ii) $(-2)+(-5)$

(2 marks)

(b) Find the value of n when $(-1)+(-2)+(-3)+(-4)+(-5)+(-6)=-7n$. (2 marks)

(c) Evaluate $(-1)+(-2)+(-3)+...+(-20)$. (3 marks)

(d) Hence, evaluate the value of $(-7)+(-8)+(-9)+...(-18)+(-19)+(-20)$. (3 marks)

10. Consider the sequence $4, 7, 10, 13, ...$

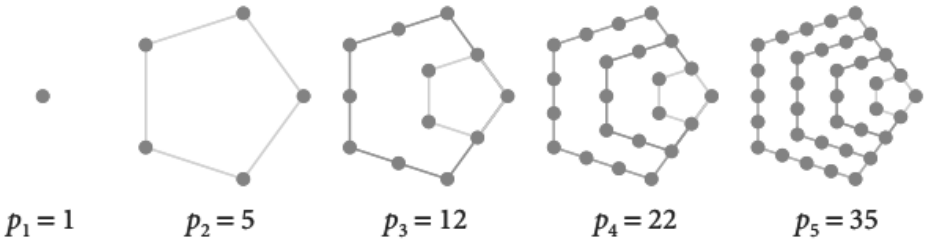
Assume T_n is the n^{th} term of the sequence and $T_n = 3n + 1$.

(a) Find the values of T_5 and T_6. (3 marks)

(b) Given that $T_k = 403$, find the value of k. (2 marks)

(c) Given that $T_u > 300$, find the smallest value of u. (3 marks)

(d) The pentagonal numbers $p_1, p_2, p_3, ...$ are the respective numbers of dots of the pentagonal arrays. The first five pentagonal numbers are shown in the following figure.



Fiona claims that the 6^{th} pentagonal array has 50 dots. Do you agree? By considering $p_2 - p_1$, $p_3 - p_2$ and $p_4 - p_3$, or otherwise, explain your answer. (2 marks)

END OF PAPER