Half-Yearly Examination 2024/2025

S1 **Mathematics Paper 1** **Time: 75 min**

Name: _____ S1 ____ ( ) Marks: _____/64

Question-Answer Book

INSTRUCTIONS:

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

2. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins. Answers written in the margins will not be marked.

3. The last question is a bonus and is considered challenging. You are recommended to complete all other questions and check your answers before attempting the last question.

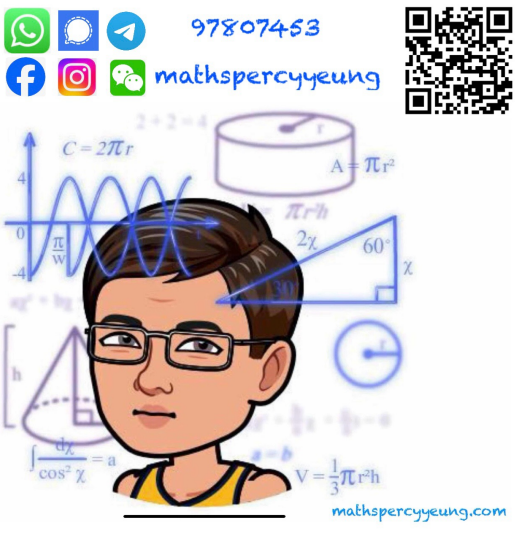
4. Unless otherwise specified, all working must be clearly shown.

5. Unless otherwise specified, numerical answers should be exact.

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

7. You are **NOT ALLOWED** to use calculators.

8. Supplementary answer sheets will be supplied on request. Write your class, name and class number on each sheet, and staple them with this Question-Answer Book.



1. (a) Round off 12 345 to the nearest thousand.
   (b) Round down 21.09 to the nearest 1 decimal place.
   (c) Round up 0.094 02 to 2 significant figures.

(3 marks)

2. Find the values of the following expressions.
   (a) $\dfrac{(-2)(-5)}{(-2)-(-5)}$
   (b) $[(-3) \times 14 - 4(-2)] \div 2$

(4 marks)

3. (a) Represent the following by an algebraic expression.
   "Divide 27 by the sum of m and square of n."
   (b) Hence, find the value of the algebraic expression in (a) when $m = -25$ and $n = -4$.

(3 marks)

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4. Expand the following expressions and arrange the terms in descending powers of the variables.

(a) $(3m-4)(-2m+5)$

(b) $4(2x-1)-(5x-3)^2$

(c) $-2(-3k+5)-(k-4)(2k+3)$

(9 marks)

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5. Simplify the following expressions.

(a) $(4x^2y - 6xy^2 - 7) - (-5xy - 4xy^2 + 9)$

(b) $(a \times 2a^2)^3 - 6a^9$

(c) $(-mn)^5 \div \left(\frac{-m}{n^3}\right)^2$

(d) $\frac{(3^{2n+2})(9^{n+1})}{(27^n)^3}$

(11 marks)

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6. Solve the following equations.

(a) $12 - x = 5(6x + 2)$

(b) $2(k - 3) = 3(-4k + 1) - 3(2k - 5)$

(c) $\frac{n}{3} - n = 5(-n + 1)$

(d) $\frac{m+1}{2} - \frac{2(m-5)}{3} = 6$

(10 marks)

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7. Ella wants to buy 6 items which cost \$26, \$75, \$57, \$20, \$24 and \$98 respectively. She has \$325 now.
   (a) By using a suitable estimation strategy, estimate whether she has enough money to pay.
   (b) \$10 coupon will be given for every \$50 purchase. Ella claims that she can get at least 5 coupons in this purchase. Do you agree? By using a suitable estimation strategy, explain your answer. (6 marks)

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8. Let a_n be the nth term in a sequence. It is given that $a_{n+2} = 3a_{n+1} - 2a_n$ for all positive integers. If $a_2 = 6$ and $a_3 = 14$, find a_1 and a_5.

(5 marks)

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9. The sum of the present age of Amy and her mother is 49 years old. 6 years ago, the age of Amy's mother was greater than 4 times Amy's age by 2. Find the present age of Amy.

(4 marks)

10. (a) Find the H.C.F. and L.C.M. of 18, 24 and 45 by using prime factorization.

(b) Benny, Carman and Doris have the same amount of stickers. Benny evenly distributed all his stickers into 18 boxes; Carman evenly distributed all her stickers into 24 bags and Doris evenly distributed all her stickers into 45 pockets. Find the minimum number of stickers owned by each person.

(5 marks)

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11. Ms Wong baked a certain number of cupcakes. The cupcakes were shared among 3 boys equally and no cupcakes were left. Later on, a girl joins the group to share the cupcakes, therefore Ms Wong bakes 9 more cupcakes for them to share. As a result, each boy gets 2 more cupcakes than before and no cupcakes are left, besides each child gets the same number of cupcakes. Let x be the original number of cupcakes Ms Wong baked.

(a) Express the number of cupcakes each child has after Ms Wong bakes 9 more cupcakes in terms of x.

(b) By setting up an equation, find the original number of cupcakes Ms Wong baked.

(4 marks)

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Bonus:

(a) Let a_n be the nth term a sequence. Given that $a_n = a_{n+1} + d$ where d is a constant. If $a_{18} = 26$ and $a_{23} = 61$, write down

(i) the value of d,

(ii) a_{100},

(iii) $a_1 + a_2 + a_3 + \cdots + a_{100}$.

(3 marks)

(b) Consider the sequence 1, 2, 3. A possible general term of the sequence is n. Write down another possible general term of the sequence.

(Hint: You may use the fact that $1^3 = 1$ and $(-1)^3 = -1$.)

(2 marks)

END OF PAPER

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