QUEEN'S COLLEGE
Half-yearly Examination, 2007-2008

MATHEMATICS PAPER 1

Question-Answer Book

Secondary 1 **Date: 9 – 1 – 2008**
Time: 8:30 am – 9:45 am

1. Write your class, class number in the spaces provided on this cover.
2. This paper consists of TWO sections, A and B. Section A carries 80 marks and Section B carries 40 marks.
3. Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Book.
4. Unless otherwise specified, all working must be clearly shown.
5. The diagrams in this paper are not necessarily drawn to scale.

Class		
Class Number		

	Teacher's Use Only	
Question No.	Max. marks	Marks
1	5	
2	6	
3	7	
4	7	
5	8	
6	8	
7	8	
8	10	
9	10	
10	11	
11	20	
12	20	
Total		

Page total

SECTION A Short questions. (80 marks)
Answer ALL questions in this section and write your answers in the spaces provided.

1. **(a)** Put the correct symbol '<' or '>" between the two given numbers. (Steps are not required for this question.)

(i) $-\frac{1}{2}$, $-\frac{1}{4}$ (1 mark)

(ii) $-5\frac{1}{4}$, $-5\frac{3}{7}$ (1 mark)

(iii) $(-2)^2$, $(-2)^3$ (1 mark)

(b) Arrange $-\frac{1}{2}$, $-5\frac{1}{4}$, $(-2)^2$, $-\frac{1}{4}$, $-5\frac{3}{7}$, $(-2)^3$ in descending order. (2 marks)

(5 marks)

2. It is given that y is a function of x, and $y = 3(4-2x)$. Find the value of y when x is

(a) 7, (3 marks)

(b) -5. (3 marks)

(6 marks)

Page total

3. In the formula $T = a + (n-1)d$,

(a) Find T if $a = -8,\ n = 6,\ d = 3$. (3 marks)

(b) Find n if $T = -27,\ a = -5,\ d = -2$. (4 marks)

(7 marks)

4. Solve $\frac{9}{2} - \frac{1}{6}(3x-1) = -\frac{2}{3}(3x+2)$

(7 marks)

Page total

5. **(a)** Evaluate $-\frac{1}{6}(-3-12)+\frac{7}{2}-\frac{2}{3}(-3+21)$ (4 marks)

(b) Evaluate $\left(-1\frac{1}{2}-4\frac{4}{7}\right)\div\left(\frac{13}{21}-3\right)$ (4 marks)

(8 marks)

Page total

6. Peter wanted to store some cans of soft drinks in a box. It was known that 2 layers of cans could be stacked up in the box and each layer contained 3×4 cans. The height and the diameter of each can had been measured to be 12.5 cm and 7 cm respectively. Estimate the smallest possible volume of the box correct to the nearest 1 000 cm^3.

(8 marks)

7. Joe wants to swim in a club which is open for members only. The membership fee is \$50 and the price of an admission ticket for each session is \$$x$.

(a) If the total amount he has to pay for the membership fee and 8 admission tickets is not more than \$250,

(i) write an inequality in x to express this. (2 marks)

(ii) write down all integers from 22 to 30 that can satisfy the inequality in part **(i)**. (2 marks)

(b) If Joe pays exactly \$242 for the membership fee and 8 admission tickets, find x. (4 marks)

(8 marks)

Page total

8. The marked price of a camera in a shop was $500.

(a) If the shop sells the camera, the owner will have a profit percent of 25%. Find the cost of the camera. (3 marks)

(b) Many customers think the camera is expensive and ask for a discount. The shop finally sells it at a discount of 40% of the marked price. Find

(i) the selling price of the camera. (3 marks)

(ii) the percentage loss. (4 marks)

(10 marks)

Page total

9. Consider the sequence: $\frac{1}{5}, \frac{1}{10}, \frac{1}{15}, \frac{1}{20}, \ldots\ldots\ldots\ldots.$

(a) Write down the next 2 terms of the sequence. (2 marks)

(b) **(i)** Use an algebraic expression to represent the general term a_n of the sequence. Give reasons to support your answer. (3 marks)

(ii) Use the result of **(b)(i)** to find a_{30}, the 30th term of the sequence. (2 marks)

(iii) If the nth term of this sequence is 0.025, find the value of n. (3 marks)

(10 marks)

Page total

10. **(a)** Follow each of the instructions below to find an estimated value of the expression: 362 + 237 + 184 + 209

(i) Round **off** each number correct to the nearest ten. (3 marks)

(ii) Round **up** each number correct to the nearest ten. (3 marks)

(iii) Round **down** each number correct to the nearest ten. (3 marks)

(b) In a shop, Ann wanted to buy 4 bottles of wine of prices \$362, \$237, \$184 and \$209 respectively. If she only had \$1000 in her wallet, she should use which method in **(a)** to estimate whether she had enough money to pay for the 4 bottles of wine, why? (2 marks)

(11 marks)

Page total

SECTION B Long Questions. (40 marks)

Answer ALL questions in this section and write your answers in the spaces provided.

Each question carries 20 marks.

11. In 2000, Joe was 53 years old and Tom was 23 years old.

(a) What percentage of Tom's age was Joe's age in 2007? (4 marks)

(b) If x years before 2000, Joe's age was 3 times that of Tom's age. Find x. (8 marks)

(c) How many years after 2000, will Joe's age be 13 years less than twice Tom's age? (8 marks)

(20 marks)

Page total

12. Mr. Li is a hawker. He borrowed \$8 000 from his friend at 15% p.a. simple interest. He used all the money to buy 200 glasses from a factory. He marked the price at \$60 each but could only sell 150 glasses. He then sold the rest of the glasses to a restaurant at a discount of 40% of his marked price. 10 months after the day he borrowed the money, he returned the principal together with the interest to his friend. Find

(a) the total selling price of the first 150 glasses. (3 marks)

(b) the total selling price of the rest of the glasses. (5 marks)

(c) the amount he should return to his friend. (6 marks)

(d) the overall profit percent made by Mr. Li , if he included the interest he paid as part of the cost in buying the 200 glasses. (6 marks)

(20 marks)

END OF PAPER

Rough Worksheet

Rough Worksheet