QUEEN'S COLLEGE
Half-yearly Examination, 2008-2009

MATHEMATICS   PAPER 1

Question-Answer Book

Secondary 1   **Date: 12 – 1 – 2009**
                                   Time: 8:30 am – 9:45 am

Class		
Class Number		

	Teacher's Use Only	
Question No.	Max. marks	Marks
1	5	
2	5	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
9	10	
10	20	
11	20	
Total	**120**	

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.   Attempts 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.

SECTION A   Short questions.   (80 marks)

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

1.   (a)   Insert the correct symbol '<' or '>" between the two given numbers.

   (i) $-\dfrac{1}{7}$, $-\dfrac{1}{4}$ (1 mark)

   (ii) $-5\dfrac{3}{4}$, $-5\dfrac{5}{8}$ (1 mark)

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

   (b) Arrange $-\dfrac{1}{7}$, $-\dfrac{1}{4}$, $-5\dfrac{3}{4}$, $-5\dfrac{5}{8}$, -2^2, -2^3 in descending order.   (2 marks)

                                                                            (5 marks)

   (a) (i)

   (ii)

   (iii)

   (b)

2.   Evaluate $5-2\left[13-10\div(-2)\right]\div 3-1$ **(5 marks)**

Page total

3. Evaluate $-2-\left[-\dfrac{1}{3}-\dfrac{2}{3}\div(-6)\right]\div 1\dfrac{1}{2}-1$

(10 marks)

4. Solve $\dfrac{x+4}{4} = \dfrac{3}{2} - \dfrac{(2x+7)}{3}$

(10 marks)

5. Mr Li has borrowed some money from a bank and will pay simple interest.

    (a) If he has borrowed $6 500 and should pay back an amount of $10 400 after 4 years, find the interest rate per annum. (5 marks)

    (b) If the interest rate is 12% p.a. and he should pay back an amount of $27 200 after 3 years, find the sum of money he has borrowed. (5 marks)

                                                                          (10 marks)

    (a)

    (b)

6. Consider the sequence: $\dfrac{1}{2}, \dfrac{1}{3}, \dfrac{1}{4}, \dfrac{1}{5}, \ldots\ldots\ldots\ldots$

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

    (b) **(i)** Rewrite the first 4 terms of the above sequence into similar

               numerical expressions and then use an algebraic expression to

               represent the general term a_n of the sequence.

                                  (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 0.02, find the value of n.   (3 marks)

                                  (10 marks)

(a)

(b) **(i)**

     (ii)

     (iii)

7. Mr. Chan has x diamond rings and Mrs. Chan has 2x diamond rings.

    (a) Write an algebraic expression to represent the total number of their diamond rings. (1 mark)

    (b) If x = 12, find the total number of their diamond rings. (2 marks)

    (c) Mr. Chan said that their total number of diamond rings is less than 12. Write an inequality to express this fact. (1 mark)

    (d) Write down all possible values of x which satisfy what he said. (1 mark)

    (e) Mrs. Chan said that their total number of diamond rings is not less than 8. Write an inequality to express what she said. (1 mark)

    (f) Does x = 4 satisfy the inequality in (e)? (1 mark)

    (g) Does x = 3 satisfy the inequality in (e)? (1 mark)

    (h) Does x = 2 satisfy the inequality in (e)? (1 mark)

    (i) Write down all possible values of x which satisfy what **they** both said. (1 mark)

(10 marks)

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

(i)

8. The diameter of a ball had been measured to be 15 cm. It was known that 4 layers of balls could be stacked up in the box and each layer contained 6×2 balls.

    (a) Find the smallest possible length, width and height of the box.   (6 marks)

    (b) Hence, find the volume of the box and round it off to the nearest 10 000 cm^3.   (4 marks)

(10 marks)

(a)

(b)

Page total

9. **(a)** Follow each of the instructions below to find an estimated value of the
expression: 337.9 + 184.4 + 266.6 + 209.8

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

    (ii) Round **down** each number correct to the nearest ten.
           (2 marks)

    (iii) Round **up** each number correct to the nearest ten.
           (2 marks)

(b) Which of the above methods will always give an estimation bigger than
the exact value?
           (2 marks)

(c) A supermarket is offering a promotion such that if a customer spends
$1000 or more, he/she will receive a free gift. Ann wants to buy 4 bottles
of wine of prices $337.9, $184.4, $266.6 and $209.8 respectively. If she
wants to have the free gift, which method in **(a)** should she use to
estimate whether she will spend $1 000 or more, why?
           (2 marks)

           (10 marks)

(a) **(i)**

    (ii)

    (iii)

(b)

(c)

SECTION B   **Long Questions.**   **(40 marks)**

Page total

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

Each question carries 20 marks.

10.   The cost price of a toy in a shop is $400. In May, it was marked at a price so that the profit per cent was 25%. In July, the marked price was then increased so that if the toy was sold at a 40% discount, the loss per cent was 10%.

    (a)   Find the marked price of the toy in May.   (4 marks)

    (b)   Find the selling price of the toy in July.   (4 marks)

    (c)   Find the marked price of the toy in July.   (6 marks)

    (d)   Find the percentage increase in the marked prices from May to July.   (6 marks)

                                                   (20 marks)

    (a)

    (b)

    (c)

    (d)

Page total

11. A tram leaves the terminal with 50 passengers on it.

(a) When the tram comes to the first stop, $\frac{3}{5}$ of the passengers on board get off the tram and 4 passengers get on it. Find the number of passengers on the tram when it leaves the first stop. (5 marks)

(b) At the second stop, $\frac{1}{4}$ of the passengers on board get off the tram and y passengers get on it. Find (in term of y) the number of passengers on the tram when it leaves the second stop. (5 marks)

(c) At the third stop, $\frac{1}{3}$ of the passengers on board get off the tram and 5 passengers get on it. If the number of passengers on the tram now is only half that when the bus left the bus terminal, find the value of y. (10 marks)

(20 marks)

(a)

(b)

(c)

END OF PAPER