Class	
Class Number	

MATHEMATICS

PAPER 1

Question-Answer Book

Secondary 2   **Date:**   **19 – 06 – 2008**

Time: **8:30 am – 9:45 am**

|	**Teacher's Use Only**	
Section A Question No.	**Max. Marks**	**Marks**
1.	4	
2.	6	
3.	6	
4.	8	
5.	9	
6.	10	
7.	10	
8.	13	
9.	14	
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 and Section B carry 80 marks and 40 marks respectively.

3.   Attempts ALL questions in this paper. Write your answer in the spaces provided in this Question-Answer Book.

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

5.   Unless otherwise specified, numerical answers should either be exact or correct to 3 significant figures.

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

SECTION A   Short questions.   (80 marks)

1. Without using calculator, find the length of AB in the figure below. (4 marks)
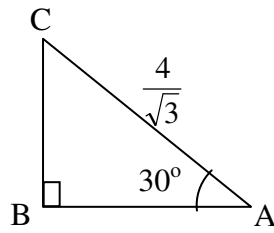
2. The scale of a map is 1 : 200,000.

    a. If a river measures 8 cm long on the map, find the actual length (in km) of the river. (3 marks)

    b. If 2 villages is 30 km apart, what is the distance (in cm) between the 2 villages on the map. (3 marks)

3. A metal cube of side = 5cm is melted and recast into a prism with a cross-section in the shape of a sector. If the radius of the sector is 6 cm and the angle at the centre of the sector is 40°, find the height of the prism.   (6 marks)

5 cm

40°

6 cm
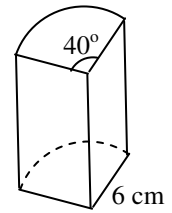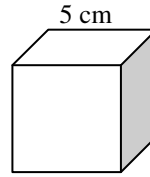
4. A sum of $900 is divided among A, B and C so that B gets twice as much as A, and C gets three times as much as B. Find

a. A's share : B's share.   (1 mark)

b. A's share : B's share : C's share. (show your workings)   (4 marks)

c. amount of A's share.   (3 marks)

5. Simplify $\dfrac{90x^2 - 40}{6a + 6x - 4 - 9ax}$. (9 marks)

6. In the figure, $\angle EFG = f$ and 'the reflex angle EFG' = $4f$,
EF // GJ, IH // FG and $j = 108°$.

a. Find the unknowns f, g and h. (7 marks)

b. Prove that HI // KJ. (3 marks)

7. In the diagram below, ABCDEFGH is a regular octagon, EFI and HGIJ are straight lines.

a. Find the size of each interior angle of the octagon. (3 marks)

b. Find $\angle EIJ$. (7 marks)

8. In the figure, ABCD is a rectangle with AD=12 cm. E is a point on AB such that AE = 9 cm and CE =20cm.

a. Prove that $\triangle$CDE is a right-angled triangle.　　(11 marks)

b. Find the area of $\triangle$CDE.　　(2 marks)

D ⎯⎯⎯⎯⎯⎯⎯⎯⎯ C

12 cm　　20 cm

A　9 cm　E　　　　B

9. Study the diagram given and find the following.

a. length of AP. (2 marks)

b. length of AC (4 marks)

c. Hence, $\angle$ABC. (8 marks)

SECTION B   Long questions   (40 marks)

10.   Answer this question without using calculator.

a.   If $(40^o + \theta) + \phi = 90^o$, express ϕ in term of θ.   (2 marks)

b.   Hence or otherwise, prove that $\dfrac{\cos(40^o + \theta)}{\tan(50^o - \theta)} = \sin(40^o + \theta)$ is an identity.   (6 marks)

10.

   c. Using $\dfrac{\cos(40^o + \theta)}{\tan(50^o - \theta)} \equiv \sin(40^o + \theta)$, find the measure of θ if

      i. $\dfrac{\cos(40^o + \theta)}{\tan(50^o - \theta)} = \dfrac{\sqrt{2}}{2}$ (4 marks)

      ii. $\dfrac{\cos(40^o + \theta)}{\tan(50^o - \theta)} = \sqrt{1 - \sin^2 \theta}$ (8 marks)

11. The height and the radius of a solid cylinder are 10 cm and 4 cm respectively. A $\frac{1}{4}$ - cylinder of the same radius and height = h cm is cut out from the original cylinder so that the volume of the $\frac{1}{4}$ - cylinder is $\frac{3}{17}$ that of the remaining portion as shown in the figure. Find

a. the cross-section area of the cut out portion. (2 marks)

b. the volume of the original cylinder. (2 marks)

c. h, the height of the $\frac{1}{4}$ - cylinder being cut out. (7 marks)

d. the total surface area of the remaining portion. (9 marks)

(Give the answers in term of π.)

END OF PAPER