CEDAR GIRLS' SECONDARY SCHOOL
End of Year Examination
Secondary One

CANDIDATE NAME

CLASS ☐☐

INDEX NUMBER ☐☐

MATHEMATICS
Paper 1

4016/01

29 September 2008

1 hour

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer all questions.
If working is needed for any question, it must be shown with the answer.
Omission of essential working will result in loss of marks.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

NEITHER ELECTRONIC CALCULATORS NOR MATHEMATICAL TABLES MAY BE USED IN THIS PAPER.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 40.

For Examiner's Use
40

This document consists of **9** printed pages and **1** blank page.

NEITHER ELECTRONIC CALCULATORS NOR MATHEMATICAL TABLES MAY BE USED IN THIS PAPER.

Answer **all** the questions.

1 Find the highest common factor (HCF) and lowest common multiple (LCM) of 1 260 and $2^3 \times 3 \times 7^2 \times 11^2$. Express your answers in index notation.

Answer   HCF = _____ [2]

LCM = _____ [1]

2 **(a)** Express 5 832 as a product of prime factors.

(b) Hence, find the value of $\sqrt[3]{5\,832}$.

Answer   *(a)* _____ [1]

(b) _____ [1]

3 Express, correct to 2 significant figures,

(a) 2 035,

(b) 0.070 09.

Answer (a) _____ [1]

(b) _____ [1]

4 Estimate the value of $\dfrac{10.49 \times \sqrt[3]{7.995}}{\sqrt{16.04}}$, giving your answer correct to 2 significant figures.

Answer _____ [2]

75

5 Given that $2\,468 \times 345 = 851\,460$, write down the exact value of

(a) $24.68 \times 3\,450$,

(b) $1\,234 \times 690$.

Answer (a) _____ [1]

(b) _____ [1]

6 (a) Express 120 mm^2 as a percentage of $0.000\,36 \text{ m}^2$, giving your answer as a fraction in its lowest terms.

(b) The marked price of a bicycle in a shop is $240. During a clearance sale, the bicycle is sold at a discount of 20%. Find the selling price of the bicycle during the sale.

Answer (a) _____ [2]

(b) _____ [2]

7 Subtract $x^3 - 2x^2 + 3x - 3$ from $3x^3 + 2x + 5$.

Answer _____ [2]

8 Simplify $\dfrac{2y^2 + 4y}{5y^2} \div \dfrac{4y + 8}{10y^2}$.

Answer _____ [3]

Cedar Girls' Secondary School   4016/01/S1/EYE08   [Turn over

9 Evaluate

(a) $\dfrac{13-(-2)}{(-1)^2 \times 10 + (-5) \times (-4)},$

(b) $\dfrac{-\dfrac{2}{3} \times \left(1\dfrac{4}{5} - 2\right)}{-\dfrac{5}{7} \div 4\dfrac{2}{7}}.$

Answer (a) _____ [2]

(b) _____ [3]

10 Solve the inequality $3 - 2x < \dfrac{1}{2}(3x - 4).$

Answer _____ [3]

11 Given that $a = -1$, $b = \dfrac{1}{2}$ and $c = 2$, find the value of

(a) $\dfrac{1}{a} + \dfrac{1}{b} + \dfrac{1}{c}$,

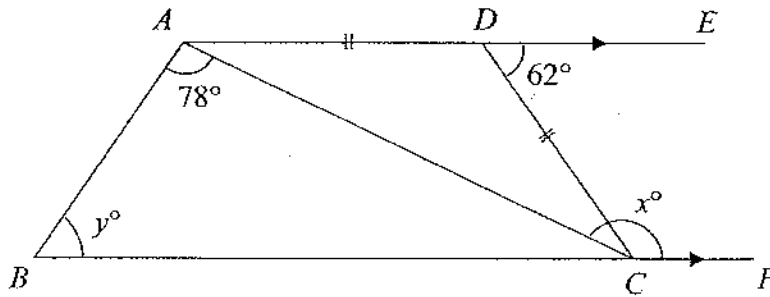**(b)** $\sqrt{\dfrac{a^2 - b^2}{\dfrac{1}{3}c^2}}$.

Answer (a) .... [2]

(b) .... [3]

79

Cedar Girls' Secondary School   4016/01/S1/EYE08   **[Turn over**

12 In the diagram, ADE and BCF are straight lines. AE is parallel to BF and $AD = DC$. $\angle BAC = 78°$ and $\angle EDC = 62°$. Find the values of x and y.
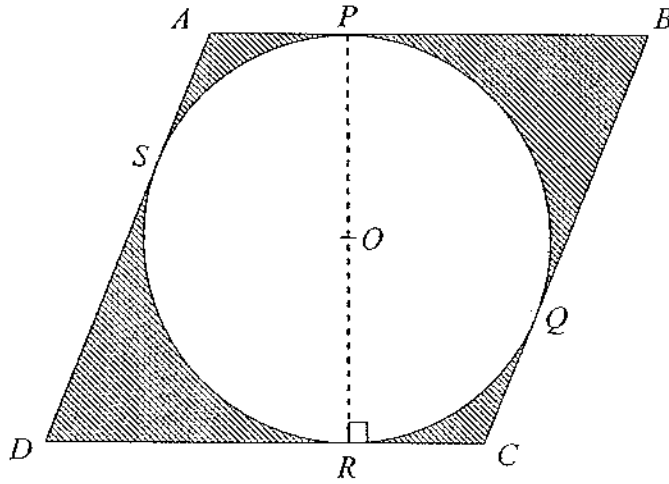

Answer $x =$ _____ [2]

$y =$ _____ [2]

13 *ABCD* is a parallelogram of area 252 cm².
PQRS is a circle, centre *O*.
The radius *OR* is perpendicular to *DC* and *DC* = 18 cm.

Taking π to be $\dfrac{22}{7}$, calculate the area of the shaded region.

Answer .... [3]

S1

CEDAR GIRLS' SECONDARY SCHOOL

END-OF-YEAR EXAMINATION
SECONDARY 1
MATHEMATICS

Paper 1 [Answer Key]

1.   HCF $= 2^2 \times 3 \times 7$

      LCM $= 2^3 \times 3^2 \times 5 \times 7^2 \times 11^2$

2.   a) $2^3 \times 3^6$

      b)   18

3.   a)   2000

      b)   0.070

4.   5.3 (2 sf)

5.   a)   85146

      b)   851460

6.   a) $33\frac{1}{3}\%$

      b) $192

7. $2x^3 + 2x^2 - x + 8$

8.   y

9.   a) $\dfrac{1}{2}$

      b) $-\dfrac{4}{5}$

10. $x > \dfrac{10}{7}$

11.   a)   1 ½

      b) $\dfrac{3}{4}$

12. $x = 149, y = 71$

13.   98 cm^2

CEDAR GIRLS' SECONDARY SCHOOL
End of Year Examination
Secondary One

MATHEMATICS
Paper 2

4016/02

29 September 2008

1 hour 30 minutes

Additional Materials: Answer Paper
                          Plain paper (1 sheet)
                          Graph paper (2 sheets)

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer all questions.
If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
Calculators should be used where appropriate.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the
answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 60.

This document consists of 7 printed pages and 1 cover page.

85

Answer **all** the questions.
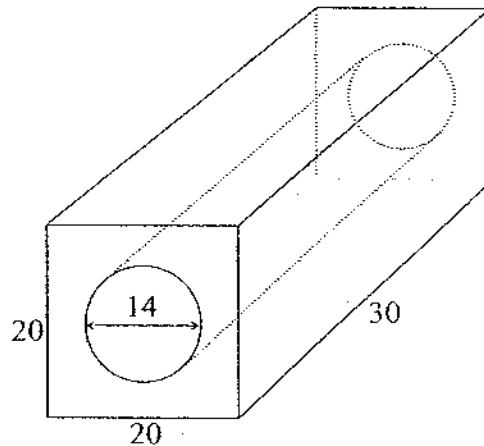
1 Consider the following pattern

$$
\begin{array}{lllllll}
a_1 & = & 3 + 5 & = & 3 + 1(5) & = & 8 \\
a_2 & = & a_1 + 5 & = & 3 + 2(5) & = & 13 \\
a_3 & = & a_2 + 5 & = & 3 + 3(5) & = & 18 \\
a_4 & = & a_3 + 5 & = & 3 + 4(5) & = & 23 \\
 & \Lambda & & \Lambda & & \Lambda & \\
a_n & = & A & = & B &
\end{array}
$$

(a) Write down the next two lines, a_5 and a_6, in the pattern. [3]

(b) If $a_x = 108$, find the value of x. [2]

(c) Write down the expressions for A and B in terms of n. [2]

2

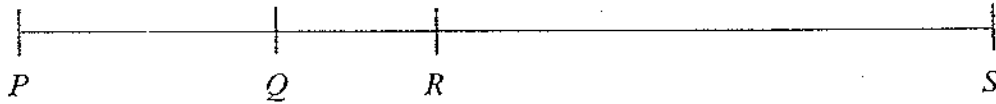The diagram shows a concrete slab of length 30 cm, width 20 cm and height 20 cm with a cylindrical hollow section of diameter 14 cm.

Taking π to be $\dfrac{22}{7}$, find

(a) the volume of the concrete slab. [3]

(b) the total surface area of the concrete slab. [4]

3 (a) In the diagram below, *PQRS* is a straight line.

P   Q   R   S

      (i) If $PR : RS = 4 : 5$, write down the ratio $PS : RS$.   [1]

      (ii) Given also that $PQ : QR = 3 : 2$, find the ratio $PQ : PS$.   [3]

(b) Given that $\dfrac{4x - 3y}{x} = \dfrac{5}{2}$, find the ratio $x : y$.   [4]

(c) The ratio of the number of male hamsters to female hamsters in a pet shop is 4 : 1 initially. After 6 female hamsters are sold, the new ratio becomes 12 : 1. Using algebraic equation, find the number of male and female hamsters initially.   [3]

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4 **Answer the whole of this question on a sheet of plain paper.**

In triangle *ABC*, $AB = 12$ cm, $BC = 7$ cm and $AC = 9$ cm.

(a) Using ruler and compasses only, construct triangle *ABC*.   [2]

(b) Measure the largest angle of the triangle.   [1]

(c) On the same diagram, construct and label

      (i) l_1, the perpendicular bisector of *AB*,   [2]

      (ii) l_2, the angle bisector of $\angle ABC$.   [2]

---

5   An oxygen tank for a diver holds 75 litres of oxygen.

(a)   In open air, before the diver dives into the water, it releases $3x$ litres of oxygen per hour.

Write down an expression, in terms of x, for the number of hours it takes to empty the oxygen tank in open air.   [1]

(b)   In water, after the diver dives into the water, it releases $2x$ litres of oxygen per hour.

Write down an expression, in terms of x, for the number of hours it takes to empty the oxygen tank in water.   [1]

(c)   It takes $(\dfrac{60}{x} - 2)$ hours longer to empty the oxygen tank in water than in open air.

Write down an equation, in terms of x, and show that it reduces to
$$\frac{75}{3x} - \frac{75}{2x} + \frac{60}{x} = 2.$$ [2]

(d)   Solve the equation $\dfrac{75}{3x} - \dfrac{75}{2x} + \dfrac{60}{x} = 2$.   [2]

(e)   Find the time taken, in minutes, to empty the oxygen tank in water. Give your answer correct to the nearest minute.   [2]

6   **Answer the whole of this question on a sheet of graph paper.**

The table shows the results of a survey on the number of books read by each student of a class of 40 students in a term.

3	2	1	5	3	6	4	3
2	1	5	3	6	4	4	5
3	5	4	4	3	4	6	5
4	5	2	2	6	4	5	6
4	5	5	2	3	5	6	6

(a) Copy and complete the following table.

Number of books	Tally	Frequency
1		
2		
3		
4		
5		
6		

[2]

(b) Using a scale of 2 cm to represent 1 unit on each axis, draw a histogram to represent the information in the table.   [3]
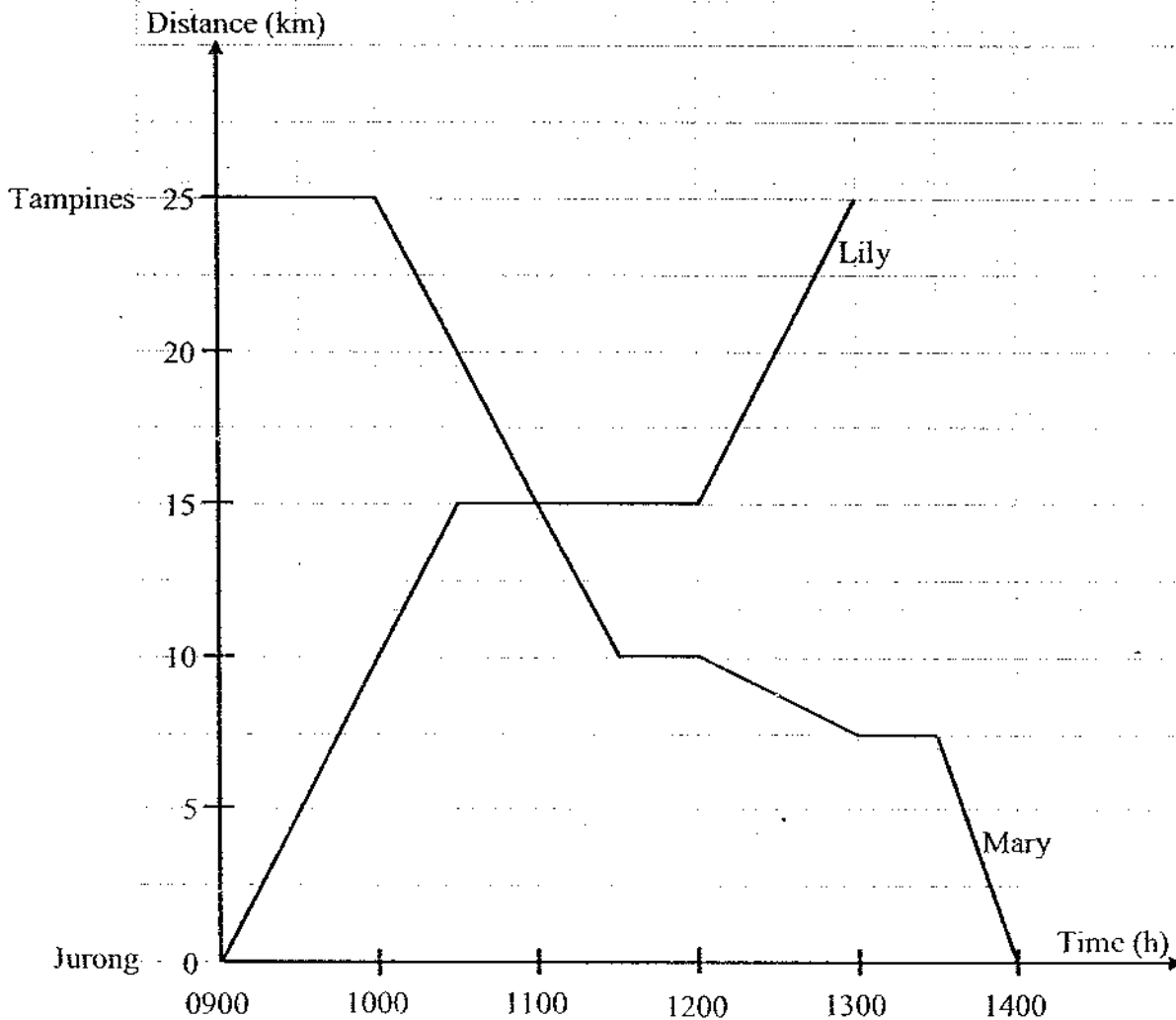
(c) Find

    (i) the number of students who read more than 4 books in a term,   [1]

    (ii) the percentage of students who read 2 books or less in a term.   [1]

7   The diagram shows the distance-time graphs of the journeys of Mary, from
    Tampines to Jurong, and Lily, from Jurong to Tampines.

(a) How long did it take Mary to reach Jurong from Tampines if she set off at
     10 00?   [1]

(b) How many times did Mary stop for the entire journey after she set off at
     10 00?   [1]

(c) State the time for which they were at the same distance away from Tampines.   [1]

(d) Calculate Lily's average speed for the whole journey.   [2]

(e) What was Mary's speed for the journey from 13 30 to 14 00?   [2]

8   Answer the whole of this question on a sheet of graph paper.

The amount of power needed, p kW, to increase the temperature of an iron rod by t °C, is given by the formula

$$p = 2t.$$

The table below shows some corresponding values of t and p.

t	0	5	10	15	20
p	0	a	20	b	40

(a) Find the values of a and b.   [2]

(b) Using a scale of 4 cm to 5 °C, draw a horizontal t-axis for $0 \le t \le 20$.

Using a scale of 2 cm to 5 kW, draw a vertical p-axis for $0 \le p \le 40$.

On your axes, plot the points given in the table and join them with a straight line.   [3]

(c) Use your graph to find the amount of power needed to increase the temperature of the iron rod by 12.5 °C.   [1]

End of Paper

Class	Index Number	Name

COVER PAGE

To be completed and submitted with answer paper

Question	Score
1	
2	
3	
4	
5	
6	
7	
8	
Total	60

Paper 2 [Answer Key]

1a. $a_5 = a_4 + 5 = 3 + 5(5) = 28$
    $a_6 = a_5 + 5 = 3 + 6(5) = 33$

1b. $x = 21$

1c. $a_n = a_{n-1} + 5 = 3 + n(5)$

2a. Volume of concrete slab $= 7380$ cm^3

2b. Total surface area $= 4212$ cm^2

3a. i) $PS : RS = 9 : 5$
    ii) $PQ : PS = 4 : 15$

3b. $x : y = 2 : 1$

3c. Initial female hamsters $= 9$
    Initial male hamsters $= 36$

4b. Largest angle $= 97^\circ$ ($\pm 2^\circ$)

5a. $\dfrac{75}{3x}$ or $\dfrac{25}{x}$

5b. $\dfrac{75}{2x}$

5c. $\dfrac{75}{2x} - \dfrac{75}{3x} = \dfrac{60}{x} - 2$

    or

    $\dfrac{75}{3x} = \dfrac{75}{2x} - \dfrac{60}{x} + 2$

    Then

    $\dfrac{75}{3x} - \dfrac{75}{2x} + \dfrac{60}{x} = 2$

5d. $x = 23.75$

5e. No. of minutes taken $= 95$ min

6c. No of students $= 17$

6d. Percentage of students $= 17.5\%$

7a. Time taken $= 4$hrs

7b. 2 times

7c. 1100hrs

7d. Average speed $= 6.25$ km/h

7e. Mary's speed $= 15$ km/h

8a. $p = 2t$

t	0	5	10	15	20
p	0	10	20	30	40

8c. Amount of power needed $= 25$ kilowatts.