GUANGYANG SECONDARY SCHOOL
MID-YEAR EXAMINATION 2008
Secondary One Express

MATHEMATICS

PAPER 1

Date: 02/05/2008
Duration: 1 hour 15 minutes

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 in the spaces provided on the Question Paper.
You may use a pencil for any diagrams or graphs.
Do not use 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.
You are expected to use a scientific calculator to evaluate explicit numerical expressions.
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 50.

This question paper consists of 10 printed pages, inclusive of this cover page.

For Examiners' Use

Answer **all** questions.

1 Express 8993.134 correct to

(a) the nearest thousand,

(b) 3 significant figures,

(c) 2 decimal places.

Answer (a).....[1]

(b).....[1]

(c).....[1]

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2 Consider the 8 numbers: $\sqrt{120}$, $-\frac{22}{7}$, $(-3)^2$, $\sqrt[3]{64}$, π, $-0.\dot{8}\dot{1}$, 0 and $(-0.3)^3$.

Write down the

(a) negative number(s),

(b) irrational number(s),

(c) natural number(s).

Answer (a).....[1]

(b).....[1]

(c).....[1]

For Examiners' Use

3 **(a)** Use a number line to represent the prime numbers > 5 and ≤ 13. [1]

(b) **(i)** Express $\frac{2}{9}$ as a recurring decimal.

(ii) Arrange the following numbers in descending order.

$$\frac{2}{9},\ 0.2,\ 0.\dot{2}\dot{0}\ \text{and}\ 0.2\dot{1}$$

Answer (b)(i).....[1]

(ii).....[1]

4 Find the next 2 terms of the following sequences.

(a) 2, 3, 5, 6, 8, 9, 11, ...

(b) $\frac{1}{2}, \frac{3}{4}, \frac{7}{8}, \frac{15}{16}, \ldots$

Answer (a).....[1]

(b).....[1]

45

For Examiners' Use

5 **(a)** Find the Highest Common Factor and Lowest Common Multiple of the two numbers $2^3 \times 3 \times 5^2 \times 13 \times 17 \times 19^2$ and $2^2 \times 3^3 \times 7^3 \times 13^2 \times 19^3$, giving your answer in prime factorised form.

(b) **(i)** Find the square of $2^3 \times 3^6 \times 5^2$, giving your answer in index notation.

(ii) Is it a perfect cube? Why?

Answer (a) HCF =.....[1]

LCM =.....[1]

(b) (i).....[1]

(ii).....

.....[1]

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6 Ryan travels at a speed of x km/h.

(a) Express the time taken for Ryan to travel a distance of 42 km, in terms of x.

(b) If Ryan drives for 1 hour and 35 minutes, express the distance travelled in terms of x.

Answer (a)..... h [1]

(b).....km [1]

For Examiners' Use

7 Simplify

(a) $2(a-3b)+6b$,

(b) $(-3x)\times(-4y)+6xy+2y-4x\times(-5x)-6y$,

(c) $3a(a-2b)-4(a^2-ba)$.

Answer (a).....[1]

(b).....[2]

(c).....[2]

46

[Turn over

For Examiners' Use

8 Given that $a = -1$, $b = \frac{1}{3}$ and $c = 0.4$, find the value of

(a) $\frac{a-b}{b+c}$,

(b) $a^2 - (bc)^3$.

Answer (a).....[1]

(b).....[1]

---

9 Showing your working clearly, estimate the value of

(a) $\frac{\sqrt{210}}{\sqrt[3]{210}}$,

(b) $\frac{(88.95)^2 \times 0.005725}{(3.0025)^3}$.

Answer (a).....[2]

(b).....[2]

For Examiners' Use

10 **(a)** If $-3 \leq x < 2$, list all the integer values of x.

(b) Hence, find the

(i) largest integer value of x^3,

(ii) smallest integer value of x^2.

Answer (a).....[1]

(b)(i).....[1]

(ii).....[1]

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11 **(a)** Factorise $3ax - ay + 6bx - 2by$.

(b) **(i)** Factorise $xy + xz$.

(ii) Hence, evaluate $44 \times 1\,275 + 1\,275 \times 56$.

Answer (a).....[2]

(b)(i).....[1]

(ii).....[2]

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For Examiners' Use

12 Solve the equation

(a) $-\frac{2}{7}y+3=\frac{4}{9}$,

(b) $\frac{2y-3}{4}=\frac{3y+6}{5}$.

Answer (a) y = ...[1]

(b) y = ...[3]

[Turn over

For Examiners' Use

13 Given that $S = \dfrac{t+2q}{4t-3q}$ and $t = 2$, $S = 4$, find the value of q.

Answer $q =$ .....[2]

14 Find the smallest integer value of x which satisfies the inequality

(a) $\dfrac{3}{4}x + 2x \geq 22$,

(b) $0.3x - 4 > -2.3x + 12$.

Answer (a) $x =$ .....[2]

(b) $x =$ .....[2]

U8

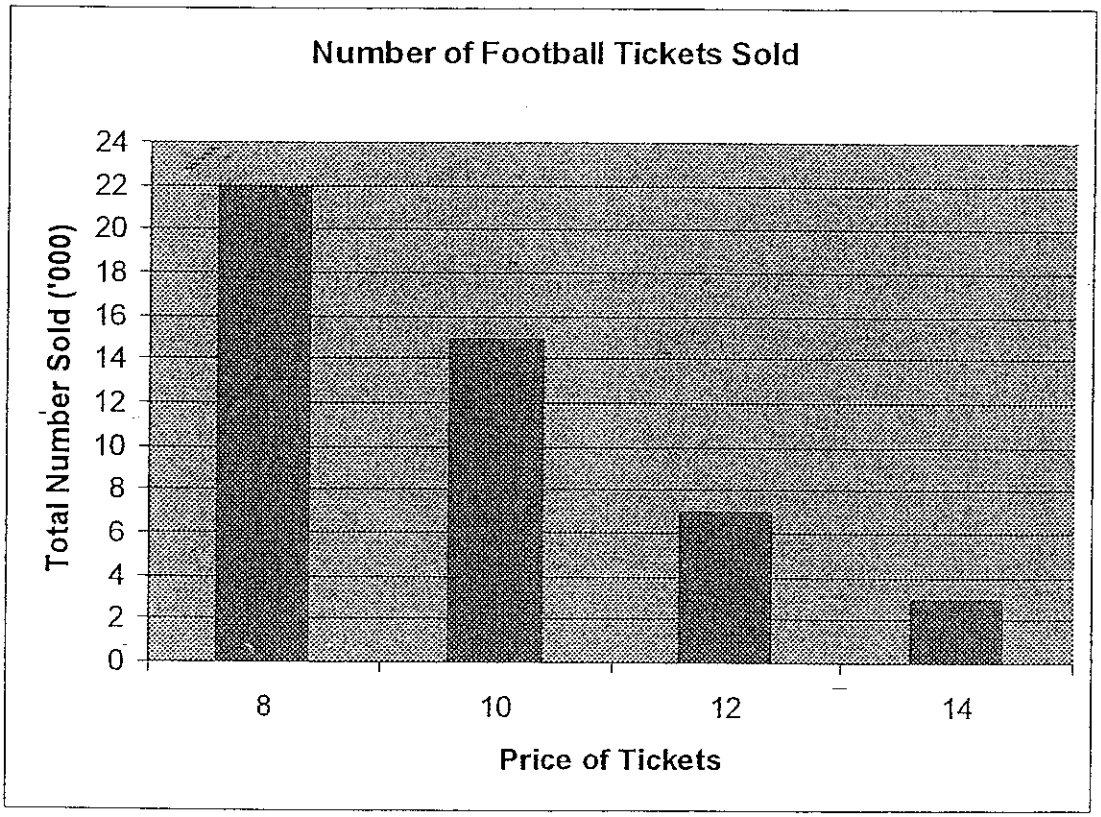
For Examiners' Use

15 The bar graph below shows the number of tickets sold for a weekend football match, held in a stadium with a seating capacity of 50 000. Find the

(a) total number of tickets sold,

(b) total sales collected from the football match,

(c) percentage of seats that were unoccupied.



Answer (a).....[1]

(b) $.....[1]

(c).....%[2]

[End]

GUANGYANG SECONDARY SCHOOL

MID-YEAR EXAMINATION 2008

Secondary One Express

MATHEMATICS

PAPER 2

Date: DD/MM/2008 **Duration: 1 h 30 min**

READ THESE INSTRUCTIONS FIRST

Write your answers and working on the separate Answer Booklet/Paper provided.
Write your class, index number and name on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a pencil for any diagrams or graphs.
Do not use 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.
You are expected to use an electronic calculator to evaluate explicit numerical expressions.
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 question paper consists of 5 printed pages, inclusive of this cover page.

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1 (a) In a test with ten questions, each correct answer is awarded 4 marks, each wrong answer is penalised 3 marks and each unanswered question will be penalised 1 mark.

(i) Find the highest possible score for the test. [1]

(ii) Find the lowest possible score for the test. [1]

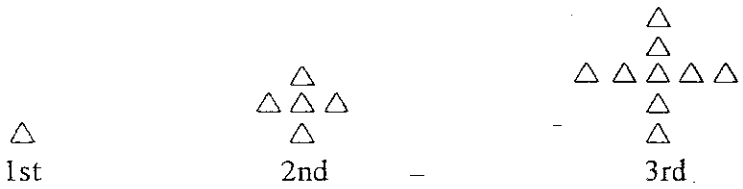
(iii) Joanne and Jocelyn sat for the test. [2]

Joanne had 6 correct answers, 2 wrong answers and 2 unanswered questions.

Jocelyn had 5 correct answers, 1 wrong answers and 4 unanswered questions.

Who had the higher score?

(b) The diagram below shows the first three of a sequence of a pattern.



(i) Draw the 4^{th} pattern. [1]

(ii) The information from the sequence of triangles is tabulated below.

Copy and complete the table. [2]

n	Formula	Number of triangles
1	1	1
2	4 + 1	5
3	4 + 4 + 1	9
4		
5		

(iii) Write down a formula to calculate the number of triangles in the nth pattern? [1]

(iv) Hence, find the number of triangles in the 30^{th} pattern. [1]

2 (a) (i) Express 1960 as a product of prime factors in index notation [2]

(ii) Find the smallest positive integer m, such that $1960m$ is a perfect square. [2]

(b) Bus A, bus B and bus C leave the interchange every 35, 40 and 42 minutes respectively. Given that the 3 buses leave the interchange together at 06 20, when is the next time that the 3 buses will leave the interchange together. [3]

3 (a) Simplify

(i) $\sqrt{25x^2y^4} \div 25x^3y^2$, [2]

(ii) $\frac{3x-1}{2x} + \frac{4x-3}{6x} - \frac{1}{3}$, giving your answer as a single fraction in its simplest form. [3]

(b) Subtract $(2p-3q+4m)$ from the sum of $(3m+p)$ and $(4q-6m)$. [3]

(c) If $\frac{x+4y}{5x+y} = \frac{3}{5}$, find the value of $\frac{x}{3y}$. [3]

4 (a) The dimensions of a rectangular box are 150 cm by 126 cm by 120 cm. The box is to be filled with identical cubes so that there will be no empty space.

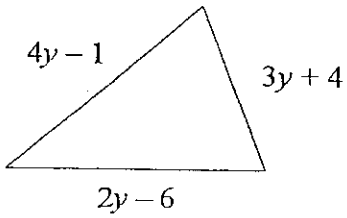
(i) Find the largest possible length of each side of a cube. [2]

(ii) Find the number of cubes that the box can contain. [2]

(b) A piece of wire is bent to form a square of area 576 cm^2.

(i) Find the perimeter of the square. [2]

(ii) The wire is then bent to form a triangle, as given in the diagram below. Find the value of y. [2]



5 **(a)** Let x be a multiple of 4.

(i) Express the next 2 multiples of 4, in terms of x. [1]

(ii) If the sum of 3 consecutive multiples of 4 is 372, write down without simplifying an equation in terms of x. [1]

(iii) Solve this equation and find the largest of these numbers. [3]

(b) Consider the number sequence 9, 18, 27, 36, ...

(i) The nth term can be expressed as pn. Find the value of p. [1]

(ii) Form an inequality to find the value of n such that pn is at least 403. [1]

(iii) Hence, find the smallest number in the sequence that is at least 403. [2]

6 The data below represents the grades that 30 pupils scored in an English test.

A	B	B	C	C	C
B	C	C	F	C	D
D	B	A	B	B	C
C	B	F	C	F	C
C	D	B	B	B	C

(a) Copy and complete the frequency table below. [2]

Grade	Tally	Frequency

(b) Write down the grade that appears most frequently. [1]

(c) Express the number of pupils who score a F as a fraction of the total number of pupils. [1]

(d) If the data is represented using a pie chart, find the angle of the sector representing the pupils who score a B. [1]

(e) Find the percentage of pupils who score a B or better. [2]

7 **(a)** The total admission fees, $\$T$ to the Singapore Zoo, for a adults and b children under the age of 12, is given by the formula $T = 24a + 13b$.

(i) Explain what the numbers 24 and 13 stand for. [1]

(ii) If a married couple brings their 3 children aged 9, 11 and 15 to the zoo, find the total admission fees. [2]

(iii) During a promotion, an adult is charged \$2 less than the usual price and a child is charged half the usual price. Find the total admission fees for 4 adults and 3 children during the promotion. [2]

(b) Jerico drove for a distance of 144 km at a speed of y km/h. He then drove for a further distance of 168 km at a speed of 15 km/h faster than the initial speed. Given that the time taken to travel both distances is the same, find the 2 speeds that Jerico drove at. [4]

---End of paper---

P2 Ans.

Answers

1(a)(i) 40

(ii) -30

(iii) Joanne

1(b)(iii) $4(n-1)+1$

(iv) 117

2(a)(i) $1960 = 2^3 \times 5 \times 7^2$

(ii) 10

2(b) 2020

3(a)(i) $\frac{1}{5x^2}$

(ii) $\frac{11x-6}{6x}$

3(b) $-p+7q-7m$

3(c) $\frac{17}{30}$

4(a)(i) 6 cm

(ii) 10 500

4(b)(i) 96 cm

(ii) 11

5(a)(i) $x+4, x+8$

(ii) $x+x+4+x+8=372$

(iii) 128

5(b)(i) 9

(ii) $9n \geq 403$

(iii) 405

6(b) C

6(c) $\frac{1}{10}$

6(d) 120°

6(e) 40%

7(a)(ii) \$98

(iv) \$107.50

7b) 90 km/h and 105 km/h

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P1 ANS.

For Examiners' Use

Answers

Question 1:
(a) 9 000
(b) 8 990
(c) 8993.13

Question 2:
(a) $-\frac{22}{7}$, $-0.8\dot{1}$, $(-0.3)^3$
(b) π, $\sqrt{120}$
(c) $(-3)^2$, $\sqrt[3]{64}$

Question 3:
(b)(i) $0.\dot{2}$
(ii) $\frac{2}{9}$, $0.2\dot{1}$, $0.\dot{2}\dot{0}$, 0.2

Question 4:
(a) 12, 14
(b) $\frac{31}{32}$, $\frac{63}{64}$

Question 5:
(a) HCF = $2^2 \times 3 \times 13 \times 19^2$
LCM=
$2^3 \times 3^3 \times 5^2 \times 7^3 \times 13^2 \times 17 \times 19^3$
(b)(i) $2^6 \times 3^{12} \times 5^4$
(ii) No, the power of 5 is not a multiple of 3.

Question 6:
(a) $\frac{42}{x}$
(b) $1\frac{7}{12}x$

Question 7:
(a) $2a$
(b) $18xy - 4y + 20x^2$
(c) $-a^2 - 2ab$

Question 8:
(a) $-1\frac{9}{11}$
(b) $\frac{3367}{3375}$

Question 9:
(a) $2\frac{1}{3}$
(b) $1\frac{4}{5}$

Question 10:
(a) $-3, -2, -1, 0, 1$
(b)(i) 1
(ii) 0

Question 11:
(a) $(a+2b)(3x-y)$
(b)(i) $x(y+z)$
(ii) 127 500

Question 12:
(a) $y = 8\frac{17}{18}$
(b) $y = -19\frac{1}{2}$

Question 13:
$q = 2\frac{1}{7}$

Question 14
(a) 8
(b) 7

Question 15
(a) 47 000
(b) \$452 000
(c) 6%

[End]