

Class	Register Number	Name
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**CHIJ SECONDARY (TOA PAYOH)  
MID YEAR EXAMINATION 2008  
SECONDARY 1 (EXPRESS)**

**MATHEMATICS**

Paper 1

5 May 2008

Candidates answer on the Question Paper.

**1 hour**

**READ THESE INSTRUCTIONS FIRST**

Write your class, register number and name 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 soft pencil for any diagrams or graphs.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

The number of marks is given in brackets [ ] at the end of each question or part question.

Show all your working in the space below the question.

**Omission of essential working will result in loss of marks.**

**The total marks for this paper is 50.**

You are expected to use an electronic calculator to evaluate 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.

	<b>FOR EXAMINER'S USE</b>
<b>PAPER 1</b>	
<b>TOTAL</b>	<b>50</b>

This document consists of 8 printed pages including the cover page.

**[Turn over**

**PAPER 1 [50 marks]**

Answer ALL the questions. All working must be clearly shown in the space provided.

1. Complete the statements in the answer spaces.

(a) 0.04375 correct to 2 significant figures is \_\_\_\_\_ [1]

(b) 0.04375 as a fraction in its lowest terms is \_\_\_\_\_ [1]

(c) 0.04375 correct to the nearest thousandth is \_\_\_\_\_ [1]

(d) 2165.89 m rounded off to the nearest 10 m is \_\_\_\_\_ [1]

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2. (a) Arrange -1, 5, -13, 29, 0 in ascending order.

(a) \_\_\_\_\_ [1]

(b) Find the decimal number exactly halfway between 1.01 and 1.02.

(b) \_\_\_\_\_ [1]

(c) Find the fraction exactly halfway between  $\frac{3}{7}$  and  $\frac{6}{7}$ .

(c) \_\_\_\_\_ [1]

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3. Without using a calculator and showing your working clearly, evaluate

$$-24 \div -10 + [-36 - 100 \div (-5)] \div 8$$

[2]

4. (a) Express 2025 as a product of its prime factors.

(a) \_\_\_\_\_ [2]

- (b) Hence evaluate  $\sqrt{2025}$ .

(b) \_\_\_\_\_ [1]

- 
5. (a) Find the HCF of 90, 126 and 198.

(a) \_\_\_\_\_ [2]

- (b) Find the LCM of  $2^3 \times 3^2 \times 5 \times 7$ ,  $2^2 \times 3^3 \times 5^2 \times 11$  and  $2^2 \times 3 \times 5 \times 11$ , leaving your answer in index notation.

(b) \_\_\_\_\_ [2]

10. Simplify the following expressions, leaving your answers in the simplest form possible.

(a)  $\frac{4}{3a^3b^2} \div \frac{2}{ab^3}$

(a) \_\_\_\_\_ [2]

(b)  $12ab - 6bc + 5ba - 3ca + 7cb$

(b) \_\_\_\_\_ [1]

(c)  $\frac{3}{2}(4e + 12) + 4\left(5e - \frac{7}{2}\right)$

(c) \_\_\_\_\_ [2]

(d)  $20xy - 16y(y - 2x)$

(d) \_\_\_\_\_ [2]

(e)  $p - [5p - 7 - 3(p + 2)]$

(e) \_\_\_\_\_ [2]

8. (a) Write down the next three terms of the following number sequence.

7, 4, 1, -2, -5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ [1]

- (b) For the following sequences, **show** the rule and write down the next three terms.

(i) 2, 4, 3, 6, 5, 10, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ [2]

(ii) 1, 3, 7, 15, 31, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ [2]

9. (a) Factorise the following expressions

(i)  $3c + 3ac - 18bc$

(i) \_\_\_\_\_ [1]

(ii)  $4x^2y^2 - 6xy^2 + x^2y^3$

(ii) \_\_\_\_\_ [1]

- (b) Using algebraic rules (without the use of a calculator), find the value of

$$59^2 - 59 \times 6^2 + 77 \times 59$$

(b) \_\_\_\_\_ [2]

10. Simplify the following expressions, leaving your answers in the simplest form possible.

(a)  $\frac{4}{3a^3b^2} \div \frac{2}{ab^3}$

(a) \_\_\_\_\_ [2]

(b)  $12ab - 6bc + 5ba - 3ca + 7cb$

(b) \_\_\_\_\_ [1]

(c)  $\frac{3}{2}(4e + 12) + 4\left(5e - \frac{7}{2}\right)$

(c) \_\_\_\_\_ [2]

(d)  $20xy - 16y(y - 2x)$

(d) \_\_\_\_\_ [2]

(e)  $p - [5p - 7 - 3(p + 2)]$

(e) \_\_\_\_\_ [2]

11. Express the following as a single fraction in its simplest form.

(a)  $\frac{x}{3} + \frac{2x}{5} - \frac{5x}{6}$

(a) \_\_\_\_\_ [1]

(b)  $\frac{y-2}{3} - \frac{2y-3}{6}$

(b) \_\_\_\_\_ [2]

(c)  $5e - \frac{3e-4}{2} + \frac{e-7}{3}$

(c) \_\_\_\_\_ [3]

12. (a) The sum of three numbers is 38. The second number is 4 times the first number. If the first number is  $x$ , write down and simplify an expression, in terms of  $x$ , for the third number.

(a) \_\_\_\_\_ [2]

- (b) A man set off on a 10 km journey by running the first  $x$  km and then walking the rest of the way at 5km/h. Write down in terms of  $x$ , an expression for the time he spent walking.

(b) \_\_\_\_\_ [1]

- (c) Two consecutive numbers are such that the larger number added to twice the smaller number gives a total of 88. Find the larger number.

(c) \_\_\_\_\_ [2]

## Answer Keys for Sec 1E Mid Year 2008 Paper One

Qn	Answer	Qn	Answer
1	(a) 0.044 (b) $\frac{7}{160}$ (c) 0.044 (d) 2170m	2	(a) -13, -1, 0, 5, 29 (b) 1.015 (c) $\frac{9}{14}$
3	2	4	(a) $3^4 \times 5^2$ (b) 45
5	(a) 18 (b) $2^3 \times 3^3 \times 5^2 \times 7 \times 11$	6	(a) 30 (b) 0.2
7	(a) 20°C (b) 2100m	8	(a) -8, -11, -14 (b) (i) 9, 18, 17 (ii) 63, 127, 255
9	(a)(i) $3c(1+a-6b)$ (ii) $xy^2(4x-6+xy)$ (b) 5900	10	(a) $\frac{2b}{3a^2}$ (b) $17ab+bc-3ca$ (c) $2(13e+2)$ (d) $4y(13x-4y)$ (e) $13-p$
11	(a) $-\frac{x}{10}$ (b) $-\frac{1}{6}$ (c) $\frac{23e-2}{6}$	12	(a) $38-5x$ (b) $\frac{10-x}{5}$ (c) 30

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**CHIJ SECONDARY (TOA PAYOH)  
MID YEAR EXAMINATION 2008  
SECONDARY 1 (EXPRESS)**

**MATHEMATICS**

Paper 2

5 May 2008

Candidates answer on the Question Paper.

**1 hour 30 minutes**

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**The total marks for this paper is 50.**

You are expected to use an electronic calculator to evaluate numerical expressions.

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	<b>FOR EXAMINER'S USE</b>
<b>PAPER 2</b>	
<b>TOTAL</b>	<b>50</b>

This document consists of 10 printed pages including the cover page.

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4. (a) Find the smallest number that is divisible by all prime numbers between 1 and 14.

(a) \_\_\_\_\_ [1]

- (b) The numbers 180 and 784, written as the products of their prime factors, are

$$180 = 2^2 \times 3^2 \times 5 \quad \text{and} \quad 784 = 2^4 \times 7^2.$$

Find

- (i) the highest common factor of 180 and 784,

(i) \_\_\_\_\_ [1]

- (ii) the smallest positive integer value of  $m$  for which  $\sqrt[3]{180 \times 784 \times m}$  is a whole number.

(ii) \_\_\_\_\_ [1]

- (iii) the smallest positive integer value of  $n$  for which  $180n$  is a multiple of 16.

(iii) \_\_\_\_\_ [1]

5. (a) Solve the following equations

(i)  $3(4.7 - 1.3k) = 6.3$

(i) \_\_\_\_\_ [2]

(ii)  $6\sqrt{k} - 8 = 64$

(ii) \_\_\_\_\_ [2]

(iii)  $3y^2 - 2 = 70 - 5y^2$  (where  $y$  is positive)

(iii) \_\_\_\_\_ [2]

(b) If  $3(x - 1) - 5(x - 4) = 8$ , find the value of  $2x - 11$ .

(b) \_\_\_\_\_ [3]

6. Solve the following fractional equations

(a)  $\frac{9}{2b-1} = 7$

(a) \_\_\_\_\_ [1]

(b)  $\frac{3}{5}(2x-5) = 1 - \frac{2}{5}(x+1)$

(b) \_\_\_\_\_ [2]

6. (c)  $\frac{a}{10} - \frac{3(a+5)}{4} = \frac{3}{4}$

(c) \_\_\_\_\_ [2]

7. What must be subtracted from  $12x + 8x^2$  to give  $6x^2 + 7x$  ?

\_\_\_\_\_ [2]

8. Alex prepares 180 chicken wings, 240 sandwiches and 300 fish balls for a party.

Assuming each guest eats the same quantity of each type of food,

- (i) what is the largest number of guests he can invite, if no food of any kind is to be left over?

(i) \_\_\_\_\_ [2]

- (ii) How many sandwiches does each guest eat?

(ii) \_\_\_\_\_ [1]

**Questions 9 to 12 must each be solved by forming an equation. Marks will not be awarded if non-algebraic methods are used.**

9. Every year a man is paid \$500 more than the previous year. If he receives \$35 000 over four years, how much was he paid in the first year?

9

\_\_\_\_\_ [2]

10. David weighs 5 kg less than John, who in turn is 8 kg lighter than Paul. If their total weight is 197 kg, how heavy is David?

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[3]

11. James is 3 times as old as his brother Peter. Five years ago, James was 8 times as old as Peter was then. Find their present age.

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[3]

12. Tom cycled for  $d$  km at a constant speed of 16 km/h and then walked for three-quarter of an hour to reach his destination. The total time taken for the whole journey was  $\frac{d-3}{8}$  hours.

(a) Write down in terms of  $d$ , an expression for the time he spent cycling.

(a) \_\_\_\_\_ [1]

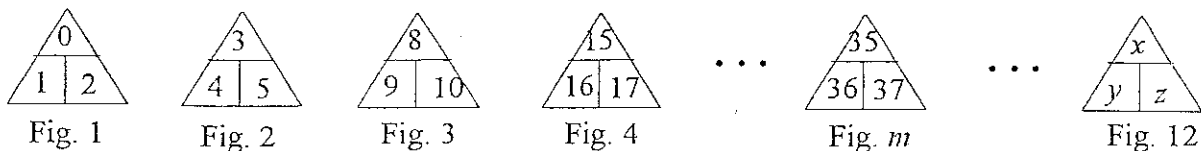
(b) Form an equation in  $d$  and solve for  $d$ .

(b) \_\_\_\_\_ [3]

(c) Hence, find in hours and minutes, to the nearest minute, the time taken for the whole journey.

(c) \_\_\_\_\_ [1]

13. (a)



Study the above pattern and

(i) write down the value of  $m$ .

(a)(i) \_\_\_\_\_ [1]

(ii) hence deduce values of  $x$ ,  $y$  and  $z$  in Fig 12.

(a)(ii) \_\_\_\_\_ [1]

(b) Consider the pattern:

$$\begin{aligned} \frac{1 \times 2}{2} + (1-1)^2 &= 1 \quad \dots \text{Line 1} \\ \frac{2 \times 3}{2} + (2-1)^2 &= 4 \quad \dots \text{Line 2} \\ \frac{3 \times 4}{2} + (3-1)^2 &= 10 \quad \dots \text{Line 3} \\ \frac{4 \times 5}{2} + (4-1)^2 &= 19 \quad \dots \text{Line 4} \\ &\vdots \\ \frac{110}{2} + (p-1)^2 &= q \quad \dots \text{Line } p \\ &\vdots \end{aligned}$$

$$\text{_____} = \frac{3n^2 - 3n + 2}{2} \quad \dots \text{Line } n \quad [1]$$

(i) Find the values of  $p$  and  $q$ .

(b)(i) \_\_\_\_\_ [2]

(ii) On the pattern above, complete line  $n$ .

(iii) Find the next term in the sequence 1, 4, 10, 19, ...

(b)(iii) \_\_\_\_\_ [1]

## Answer Keys for Sec 1E Mid Year 2008 Paper Two

Qn	Answer	Qn	Answer
1	(a) $2\frac{1}{9}$ or 2.1 (b) -50	2	$\sqrt{0.0327}$ , 0.18i, $\frac{2}{11}$ , $0.4336^2$
3	(a) $-4\frac{1}{6}$ (b) $8\frac{1}{2}$ or 8.5	4	(a) 30030 (b) (i) 4 (ii) 525 (iii) 4
5	(a) (i) 2 (ii) 144 (iii) 3 (b) -2	6	(a) $1\frac{1}{7}$ (b) $2\frac{1}{4}$ (c) $-6\frac{12}{13}$
7	$2x^2 + 5x$	8	(i) 60 (ii) 4
9	\$8000	11	Peter is 7 years old - James is 21 years old
10	$59\frac{2}{3}$ kg		
12	(a) $\frac{d}{16}$ (b) $\frac{d}{16} + \frac{3}{4} = \frac{d-3}{8}$ $d = 18$ (c) 1 hr 53 mins	13	(a)(i) 6 (ii) $x = 143$ , $y = 144$ , $z = 145$ (b) (i) $p = 10$ , $q = 136$ (ii) $\frac{n(n+1)}{2} + (n-1)^2$ (iii) 31