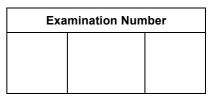


MID-YEAR EXAMINATION 2013 – 2014

FORM 3 MATHEMATICS PAPER I Section A, B Question-Answer Book

Form 3 Paper I



	Marker's
	Use Only
Page No.	Marks
2	(10)
3	(6)
4	(9)
Section A	
Total	
5	(4)
6	(7)
7	(11)
8	(6)
9	(7)
Supplementary	
Answer Sheet	
Section B	
Total	
Total:	

INSTRUCTIONS

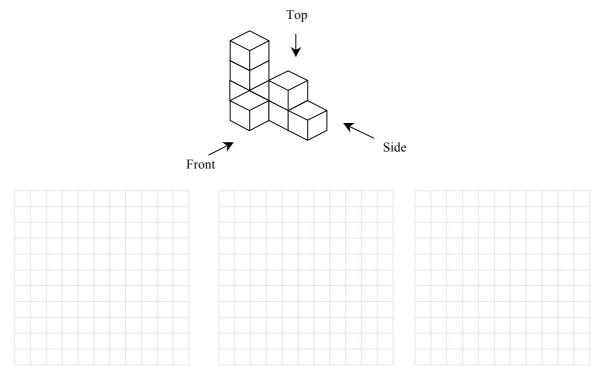
- 1. Write your examination number in the spaces provided on this cover.
- 2. In this paper, Section A carries 25 marks and Section B carries 35 marks.
- 3. Attempt ALL questions in the two sections. Do not write in the margins. Answers written in the margins will not be marked.
- Supplementary answer sheets will be supplied on request. Write your Examination Number on each sheet and put them INSIDE this book.
- 5. Unless otherwise specified, all working steps must be clearly shown.
- 6. Unless otherwise specified, numerical answers should either be exact or correct to 3 significant figures.
- 7. The diagrams in this paper are not necessarily drawn to scale.

Section A – Foundation Questions (25%)

1. Sam weighs 42.6 kg, correct to the nearest $\frac{1}{5}$ kg. What are the lower limit and the upper limit of this measurement? (3 marks) 2. Simplify $\left(\frac{a^4b^{-2}}{a^{-3}b^0}\right)^{-1}$ and express your answer with positive indices. (3 marks) Solve the following inequality and represent the solution graphically. 3. a) $\frac{3x+1}{5} \le \frac{2x-3}{8}.$ Find the largest integer that satisfies the given inequality. (4 marks) b)

Solve $\begin{cases} y = 3 - \frac{1}{2}x\\ x + 2y = 4 \end{cases}$	(3 marks)	
	The format is the mid-point of RS and the ratio of the areas of QRX (3 marks)	
		P
	(3 marks)	
	(3 marks)	P
In the figure, <i>PQRS</i> is a rectangle and <i>PSXY</i> is 1 : 2, find <i>QY</i> : <i>PY</i> .	(3 marks)	P

6. Draw the front, top and side views of the following object.

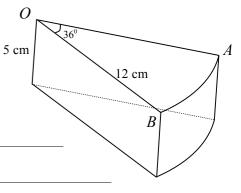


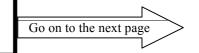
7. Kitty puts \$500 000 in a bank as a one-year fixed deposit for 4 years. The annual interest rate for the first 3 years is 8% and that for the last year is 10%. If both the principal and interest will be put in the fixed deposit upon renewal, what is the total interest she will get after 4 years? (3 marks) (Give the answer correct to nearest thousand dollars)

- 8. The figure shows a cake in which the top and the bottom sectors are the same. Find
 - a) the area of sector OAB,
 - b) the volume of the cake,
 - c) the length of \widehat{AB} ,

(3 marks)

(Take $\pi = \frac{22}{7}$ and give the answers correct to 1 decimal place.)





Section B – Short Questions (35%)

9. a) Simplify
$$\left(\frac{2\sqrt{11} + 3\sqrt{3}}{\sqrt{11} - \sqrt{3}}\right) \left(\frac{\sqrt{11} + \sqrt{3}}{\sqrt{11} + \sqrt{3}}\right)$$
.

b) Solve $\sqrt{11}(y-2) = \sqrt{3}(y+3)$ and using (a) to simplify your answer. (4 marks)

(Leave your answers in surd form)

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1

 10. Find <i>x</i>, <i>y</i>, <i>z</i> and <i>u</i> in the figure. (Give the answers correct to 2 decimal places.) 	(4 marks)	$B \xrightarrow{y \longrightarrow u \rightarrow} C$

- 11. A restaurant provided five set lunches A, B, C, D and E for the customers. Their prices were \$15, \$20, \$25, \$30 and \$35 respectively. Because of the inflation, the restaurant should increase the price of each set lunch in order to maintain the profit rate. The new prices for set lunches A, B, C and D are \$18, \$22, \$28 and \$32 respectively while set lunch E is cancelled.
 - (a) Find the original mean price of the set lunches.
 - (b) Find the new mean price of the set lunches.

(c) The restaurant owner claims that average price of the set lunches remains unchanged. Do you agree? Explain your answer. (3 marks) 12. The scores obtained in throwing a die and the corresponding frequencies are recorded in the following table.

Score	1	2	3	4	5	6
Frequency	6	9	10	7	6	Х

If the mean score is 3.68, find

- a) the value of x;
- b) the median of the scores;
- c) the mode of the scores.

(5 marks)

13. The sides of triangle $\triangle ABC$ are AB = 7, BC = 5 and $CA = 10 - \frac{5}{2}x$.

- a) Find the range of values of *x*.
- b) Is *AB* the longest side of $\triangle ABC$? Explain briefly.

(6 marks)

14. In the figure, *ABCD* is a parallelogram. Given that *EBKDF* is a straight line and $\angle BAE = \angle DCF$.

A

a)	Show that $\triangle ABE \cong \triangle CDF$.
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b) Show that *AECF* is a parallelogram. (6 marks)

K D В C E^{ℓ}

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F

15. In the	figu	re, Δ/	ABC	is ar	i isoso	celes	triang	le such	that
AB =	AC	and	M is	s mi	d-poi	nt of	<i>BC</i> .	Show	that
othoce	ntre,	incer	ntre, (circu	mcent	tre ar	nd cen	triod an	e on
AM.								(7 mark	s)

$ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$
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Supplementary Sheet
End of Section A and Section B

2013-2014 F3 MY Mathematics - Paper I Section A & B

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Mid-Year 2013-2014 F.3 MATHS PAPER I SECTION C

> LA SALLE COLLEGE MID-YEAR EXAMINATION 2013-2014

Exam		
Number		

Form 3 Mathematics Paper 1

Section C

Question No.	Marks
1	(9)
2	(12)
3	(10)
4	(9)
Supp. Sheet	
Section C	
Total	(40)

Question – Answer Book

Instructions

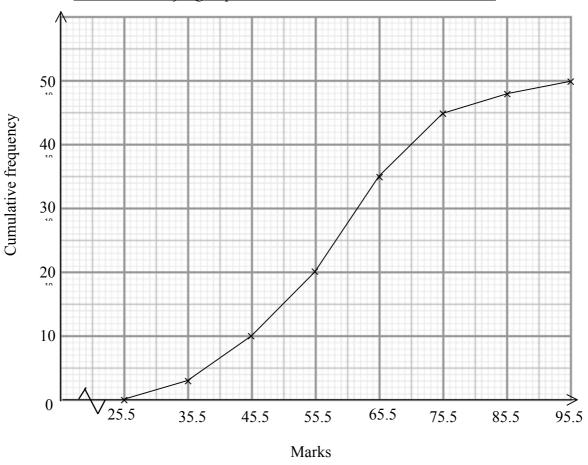
- 1. Write your examination number in the spaces provided on the top right corner of this cover page.
- 2. The total mark of this section is 40.
- 3. Attempt ALL questions in this section.

Write your answers in the spaces provided in this Question-Answer Book. The last page is a supplementary answer sheet.

- 4. All working must be clearly shown.
- 5. Unless otherwise specified, numerical answers should be either exact or correct to **3 significant figures**.
- 6. The diagrams in this paper are not necessarily drawn to scale.
- 7. Use of HKEAA approved calculators is allowed.

Section C [40 marks]

1. The cumulative frequency polygon below shows the marks of Mathematics Examination scored by a group of students.



Marks scored by a group of students in Mathematics Examination

(a) Complete the following frequency distribution table for the Mathematics marks.

				(2 marks
Marks	26 –			
Frequency	3			2

(b) Find the mean mark of the Mathematics examination.

(2 marks)

Form 3 Maths – Mid-Year Exam 2013-2014

(c) Find the median mark of the Mathematics examination.	(1 mark)
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(d) For promotion to class A or B, school will use the weighted mean score. Students will be promoted to the class with a higher weighted mean score. The weight allotted to each subject for class A and B are given in the following table. Amy's marks are shown in the table and her Mathematics mark is equal to the upper class limit of the modal class in the frequency distribution table in (a). Which class will Amy be promoted to?

Subject	English	Chinese	Science	Humanities	Math
Weight for A	10	7	5	10	10
Weight for B	10	7	10	5	10
Amy's mark	67	78	79	66	

(4 marks)

Salaries Tax on Net Chargeable		
Income by Progressive rates		
Net chargeable income	Rate	
On the first \$40 000	<i>x</i> %	
On the next \$40 000	8%	
On the next \$40 000	<i>y</i> %	
On the remaining	17.5%	

	Net chargeable	Salaries
	income	<u>tax</u>
Mary	\$100 000	\$6 800
John	\$200 000	\$23 400

Table (2)

Table (1)

(a) Table (1) shows the progressive rates for calculating the salaries tax in the current year in a city. Table (2) shows the net chargeable incomes and salaries taxes payable by Mary and John in the current year. Find the values of x and y. (5 marks)

 on his net chargeable income or at standard rate on his total annual income (before deduction of the sum of all allowances), whichever is the lower. Given that the standard rate for the current year is 15%. (Net chargeable income = Total annual income – sum of all allowances.) Mr Chan's total annual income is \$P and his sum of all allowances is \$168 000. It is known that Mr Chan has to pay salaries tax at the standard rate. (i) Express his salaries tax in terms of P. 			
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(i) Express his salaries tax in terms of <i>P</i> .]	Mr Chan's total annual income is P and his sum of all allowances is \$168 000.	It is known
	1		
			<i></i>
(11) Find the least value of P . (4 marks)		(ii) Find the least value of P .	(4 marks)

Mr Lee's allowance for the current year is also \$168 000. His monthly salt three years ago. His monthly salary increased at a rate of r % per year, when	
	re <i>r</i> is a positive
three years ago. His monthly salary increased at a rate of r % per year, when integer. Mr Lee does not need to pay salaries tax at standard rate this year	re <i>r</i> is a positive Find the
three years ago. His monthly salary increased at a rate of r % per year, when integer. Mr Lee does not need to pay salaries tax at standard rate this year	re <i>r</i> is a positive Find the
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Page Total

and the c	e figure, E and F are the mid BC respectively. Given that liagonals BD and AC meet a sut EF at H and G respective	at <i>EF//AB</i> , and t <i>J. BD</i> and	G H	
(a)	Prove that $DC //AB$.	(3 marks)		
(b)	Given that $AJ = 10$ cm, $JC = DJ - JH = 3$ cm. Find the 1		>	B

Form 3 Maths – Mid-Year Exam 2013-2014

Page Total https://www.study-together.com/edu/

4. (a) ABCD is a rectangle where AD = (8 - 2x) cm and AB = 8x cm. The diagonals of the rectangle intersect at O. Given that OA = (5x - 1) cm. Find the possible value(s) of *x*. (3 marks) В A 0 \cap D (b) The line CB is produced to E such that BE = CB. (i) Find the length of *FB*. (4 marks)

Page Total

(ii) A student claims that <i>CF</i> bisects $\angle ACE$, do you agree with him? Explain your answer.	
(2	
marks)	

Supplementary Answer Sheet		
- End of Section C -		