Exam		
Number		

FINAL EXAMINATION 2012-2013

## Form 3 Mathematics Paper 1

Time allowed : 90 minutes

## Section A and B

## **Question – Answer Book**

## Instructions

- 1. Write your examination number in the spaces provided on the top right corner of this cover page.
- 2. Section A carries 20 marks. Section B carries 40 marks.
- 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, or mark may be deducted.
- 5. Unless otherwise specified, numerical answers should be either exact or correct to **3 significant figures**.
- 6. Use of HKEAA approved calculators is allowed.
- 7. This paper must be answered in English.
- 8. The diagrams in this paper are not necessarily drawn to scale.

Page No.	Marks
1	
2	(8)
3	(12)
4	(10)
5	(9)
6	(12)
Total Marks	(60)

Section A	[20 marks]	
1. Simplify	$\frac{(2a^{-1})^2}{(3ab)^{-1}}$ and express the result with positive indices.	
		(2 marks)
2. (a) M	ake y the subject of the formula $\frac{2}{x+y} = 5 - x$ .	
	nd y when $x = -2$ .	
		(3 marks)
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		ot write
		(3 marks)
		Dea
3. (a) Fa	ctorize $x^2 - y^2$ .	
(b) H	ence, or otherwise, evaluate $998^2 - 4$ without using a calculator.	(3 marks)
		(3 marks)
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4.	Write down the number of axes of symmetry and the order of rotational symme a square.	try for (2 marks)
5.		$E + 10^{\circ} D = 120^{\circ} C$
6.	In the figure, find QR in simplified surd form. (3 marks) P = 8  cm 4  cm Q	
7.	Simplify $\frac{15}{\sqrt{5}}$ .	(2 marks)
8.	In the figure, <i>ABCD</i> and <i>CDEF</i> are rectangles. It is given that $AB = 20 \text{ cm}$ , $BC = 5 \text{ cm}$ and $CF = 12 \text{ cm}$ . Find the total surface area of the solid. (3 marks)	A D D C C
G	-2 -	Page Total

9.	tion B[40 marks]Solve the following inequality and represent the solutions graphically.472	(2
	$\frac{4}{3}x - \frac{7}{15} > \frac{2}{5}x$	(3 marks)
10.	In the figure, P is the orthocentre of $\Delta ABC$ .	A
	It is given that $\angle ACB = 30^{\circ}$ and $BC = 20$ cm.	E
	Find CE in surd form.(4 marks)	Р
	C 30°	DB
••••••		
11.	The prices of 10 toys in a toy shop are \$45, \$10, \$50, \$10, \$80, \$70, \$10, \$ The shop evenes claims that the evenese price of the toys is \$10	60, \$10, \$65.
	<ul><li>The shop owner claims that the average price of the toys is \$10.</li><li>(a) Which average is used by the shop owner ?</li></ul>	
	<ul><li>(b) Can the shop owner's claim reasonably reflect the central tendency of</li></ul>	of the prices ?
	Explain briefly.	-
		(3 marks)
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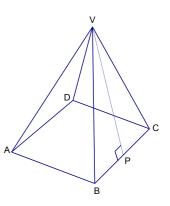
12. (a) Prove the following i	$\cos^2 \theta$	$\frac{1}{\cos\theta}$ .	
(b) Solve the equation	$\frac{\sqrt{(1-\sin\theta)(1+\sin\theta)}}{\cos^2\theta} = 2$		(4 marks)
13. In the figure, <i>ABCD</i> is a second secon	quare. Δ <i>ADE</i> is equilateral. (5 marks)	C	Please do not write in the margin
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14.	(a)	Factorize	$x^2$	-5x - 14.
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- (b)
- Solve the quadratic equation  $x^2 5x 14 = 0$ . Solve the quadratic inequality  $x^2 5x 14 \le 0$ . (c)

	(c) Solve the quadratic inequality $x - 5x - 14 \le 0$ .	(7 marks)	
15.	As shown in the figure, $L_1$ , $L_2$ and $L_3$ are three staright lines such that $L_1 // L_3$ . Also $L_2$ is perpendicular to both $L_1$ and $L_3$ . Find the slopes of $L_1$ , $L_2$ and $L_3$ . (5 marks)	, L2	Please do not write in the margin
		Q (5 , -1) L <sub>1</sub> L <sub>3</sub>	L .
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16. In the figure, VABCD is a right square based pyramid. Given that AB = 20 cm and VP = 26 cm. Find the volume of the (4 marks) pyramid.



- 17. In a box containing 3 green balls and 2 red balls, two balls are selected randomly one by one without replacement.
  - (a) Draw a table to show all outcomes of the selection.
  - (b) A game is designed as follows:
    - (i) A player pays \$5 to select two balls randomly from the above box. If the selected balls are the same colour, \$10 is awarded.
    - If the colours of the selected balls are different, nothing is awarded. (ii)

Please do not write in the margin The game organizer claims that this is a fair game. Do you agree ? Explain in terms of expected value. (5 marks)

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Supplementary Answer Sheet	
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