

LA SALLE COLLEGE  
FINAL EXAMINATION 2013-2014

# Form 3 Mathematics

## Paper 1

### Section C

Time allowed: 105 minutes

#### Question – Answer Book

##### Instructions

1. Write your examination number in the spaces provided on this cover.
2. The total mark of this section is 40.
3. Attempt ALL questions in this section. Do not write in the margins. Answers written in the margins will not be marked.
4. 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.

Exam Number	
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Page No.	Marks
1	(4)
2	(6)
3	(4)
4	(6)
5	(5)
6	(5)
7	(3)
8	(7)
9	
10	
<b>Section C</b>	
<b>Total</b>	<b>(40)</b>

**Section C [40 marks]**

1. Six tickets are numbered 1, 2, 3, 4, 5 and 6 respectively. Andy has to choose two tickets one by one randomly with replacement. The first ticket is selected from the six tickets randomly while the second ticket is selected only with number greater than or equal to the number shown on the first ticket.

(a) Draw a tree diagram to show all the possible outcomes. (3 marks)

(b) Find the probability that the sum of the two numbers is 6. (1 mark)

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(c) Find the probability that the sum of the two numbers is a prime. (1 mark)

Answers written in the margins will not be marked

(d) Find the probability that the sum of the two numbers is a prime but less than 5.

(1 mark)

(e) \$50 coupon will be given to Andy if the sum of the two numbers drawn is even. \$100 coupon will be given to him if the product of the two numbers drawn is odd. Find the expected gain of Andy. (4 marks)

Answers written in the margins will not be marked

2. A ship is sailing on the route from  $P$  to  $Q$ . Given that the true bearing of  $A$  from  $P$  is  $030^\circ$ .



(d) Find the compass bearing of  $Q$  from  $A$ .

(2 marks)

3. In the figure, three straight lines  $L$ ,  $L_1$  and  $L_3$  have the same  $x$ -intercept.  $L_2$  intersects  $L$ ,  $L_1$

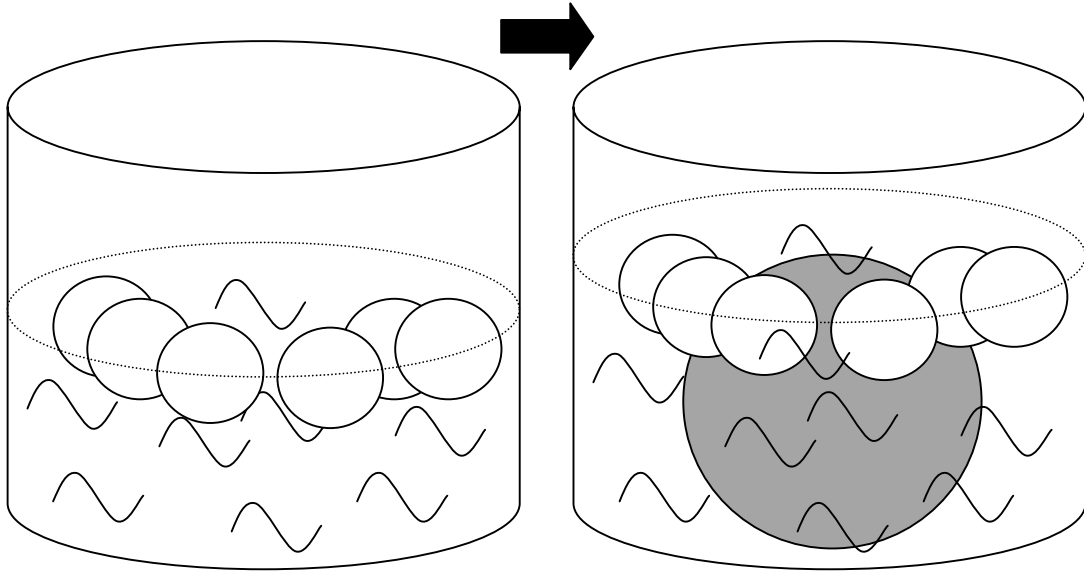


(d) Find the area of the shaded region.

(2 marks)

4. The figure shows a cylinder with base radius 32 cm. 6 identical plastic spherical balls are

put into the cylinder and they are half-immersed on the water.



- (a) When the 6 identical plastic balls are put into the cylinder, the water level rise 2 cm. Find the radius of a plastic ball. (3 marks)

Answers written in the margins will not be marked



(b) If a metallic ball with radius 2 times of that of a plastic ball drop into the water and just immersed the whole ball, find the volume of water in the cylinder. (5 marks)

(c) Hence, find the original water level before the seven balls were added. (2 marks)

Answers written in the margins will not be marked

## Supplementary Answer Sheet

Answers written in the margins will not be marked

- End of Section C -