2015-F3 FINAL MATH PAPER 1AB

LA SALLE COLLEGE FORM THREE FINAL EXAMINATION 2014 – 2015

MATHEMATICS PAPER 1

Question-Answer Book for Sections A and B

(Section C questions are printed on a separate question-answer book.)

8.10 am - 9.55 am (1³/₄ hours)

This paper must be answered in English

INSTRUCTIONS FOR SECTIONS A AND B

- 1. After the announcement of the start of the examination, you should first write your Examination Number in the spaces provided on Pages 1, 3 and 5.
- 2. Attempt ALL questions in both sections. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins. Answers written in the margins will not be marked.
- 3. Supplementary answer sheet is provided on Page 12. Extra supplementary answer sheets will be supplied on request. Write your Examination Number on each sheet and put them INSIDE this book for questions in Sections A and B.
- 4. Unless otherwise specified, 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. No extra time will be given to candidates for writing the Examination Number after the 'Time is up' announcement.

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Sections A and B

FORM 3

Ex	amination Numb	ber

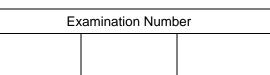
	Marker's Use Only
Question No.	Marks
1 – 2	
3 – 4	
5 - 6	
7	
Section A Total	
8 – 9	
10 – 11	
12 – 13	
14	
15	
16	
Section B Total	

SECTION A (20 marks) Simplify $\frac{(x^{-3} y^2)^3}{x^4 y^{-5}}$ and express your answer with positive indices. 1. (2 marks) Answers written in the margins will not be marked. Answers written in the margins will not be marked. Expand $-6x + x(2x-1)^2$ and arrange the terms in descending powers of x. (2 marks) 2.

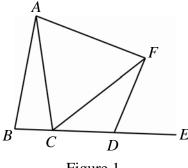
Factorize $9m^2 - 12mn + 4n^2 - 16x^2$. (3 marks) 3. Answers written in the margins will not be marked. Make x the subject of the formula $y = \frac{3x+2}{5} - \frac{2-x}{3}$. 4. (3 marks)

nearest 0.5 cm . Find the upper limit of the actual area of the picture.	(3 marks)
The marked price of a toy car is \$ 50 . It is sold at a discount of 15 % .	
 The marked price of a toy car is \$ 50. It is sold at a discount of 15%. (a) Find the selling price of the car. (b) If the cost price of the toy car is \$ 25, find the profit percentage. 	
(a) Find the selling price of the car.	(4 marks
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7. In Figure 1, *BCDE* is a straight line, where AB = AC = CF = FA, $\angle AFD = 90^{\circ}$ and $\angle FDE = 70^{\circ}$. Find $\angle ABC$. (3 marks)



	$B \frac{V}{C} \frac{T}{D}$ Figure 1	———— <i>E</i>	
vers written in the margins will not be mark			

SECTION B (40 marks)

8. Solve the inequality 4(x+4)-3(2x-1)>8 and represent the solution graphically. (3 marks)

9.

Solve $12x^2 - 17x + 6 = 0$.	(2 marks
Hence, solve $(y+1)^2 = \frac{17}{12}(y+1) - \frac{1}{2}$.	(2 marks
12 2	

10. *CD* is a vertical tower of height $h \,\mathrm{m}$. Adrian is looking at the top of the tower from *A* and the angle of elevation is 30° . He then walks towards the tower for 100 m to *B* and finds that the angle of elevation is now 50° . It is given that *A*, *B* and *C* lies on the horizontal ground. Find the height of the tower. (4 marks)

11. The mean and the mode of 28, 57, 32, 57, 28, 23, x and y are 36.75 and 28 respectively,where x > y. Find the values of x and y.(4 marks)

Answers written in the margins will not be marked.

12. The following shows the results of a Mathematics test of a group of students, where grade A is the best grade while grade F is the worst grade. A student is randomly selected from the group.

Grade	А	В	С	D	Е	F
No. of students	12	15	35	24	9	5

(a) Find the probability that the selected student obtains grade A.

(2 marks)

(b) If the passing grade is D, find the probability that the selected student passes the test.

(2 marks)

fc e in n v wc

13. Nathan invested a sum of \$ *P* at 8 % p.a. with simple interest for two years. Keith invested the same amount of money for the same period of time at the same interest rate, but the interest was compounded yearly. The compound interest received by Keith was \$ 160 more than the simple interest received by Nathan.

- (a) Find the value of P.
- (b) If Desmond invested the same amount of money \$ *P* for two years at the same interest rate, but the interest was compounded quarterly, find, correct to the nearest cent, the total amount that Desmond would receive.
 (2 marks)

(2 marks)

 a) Show that △ABC is isosceles. b) Find the coordinates of the centroid of △ABC . 	(2 marks) (3 marks)

9

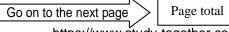
Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

15.	It is given that $\tan \theta = \frac{2t}{1-t^2}$.	(2
	(a) Find $\sin \theta$ and $\cos \theta$ in terms of t.	(3 marks)
	(b) Hence, prove that $\frac{\cos\theta}{1-\sin\theta} - \frac{1}{\cos\theta} \equiv \tan\theta$.	(3 marks)
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Page total

16. In Figure 2, ABC is a straight line and $\angle DBE = \angle CDE$ and $\angle AED$ respectively. $C \qquad B \qquad D \qquad Figure 2$	90° . <i>BD</i> and <i>BE</i> are angle bisectors of A E
(a) Prove that $AE //CD$.	(3 marks)
(b) Show that $AB = BC$.	(3 marks)
Answers written in the margins will not be marked.	



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END OF SECTIONS A AND B

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