Final Exam 2012-2013
F.3 MATHS
PAPER I
SECTION C

LA SALLE COLLEGE
FINAL EXAMINATION 2012-2013

Exam Number

Form 3 Mathematics Paper 1

Section C

Question – Answer Book

Instructions

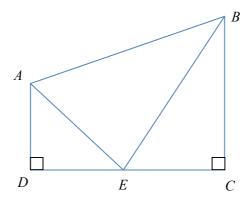
- 1. Write your examination number in the spaces provided on the top right corner of this cover page.
- 2. The total mark of this section is 40.
- Attempt ALL questions in this section.
 Write your answers in the spaces provided in this
 Question-Answer Book. The last two pages are supplementary answer sheets.
- 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.
- 8. This paper must be answered in English.

Question No.	Marks
1	(9)
2	(9)
3	(11)
4	(11)
Section C Total Marks	
	(40)

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Section C [40 marks]

1. In the figure, ABCD is a trapezium where $\angle ADC = \angle BCD = 90^{\circ}$. E is a point on DC such that AD = DE = EC = 1 and BE = 2.



(a) Find the length of BC and hence find the area of $\triangle AEB$.

(3 marks)

(b) Show that $\angle AEB = 75^{\circ}$.

(2 marks)

(c) Using the above results, find the **exact** value of sin75°.

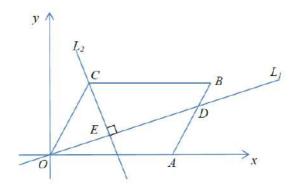
(4 marks)

(Leave your answers in surd form if necessary.)

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2. In the figure, O(0, 0), A(10, 0), B and C(3, 6) are the vertices of a parallelogram. L_1 is a straight line passing through O and intersects AB at D such that AD: DB = 2:1.



(a) Write down the coordinates of B.

(1 mark)

(b) Find the equation of L_1 .

(3 marks)

(c) L_2 is another straight line passing through C and perpendicular to L_1 . Find the equation of L_2 .

(2 marks)

(d) L_1 and L_2 intersect at E, find the ratio OE : ED.

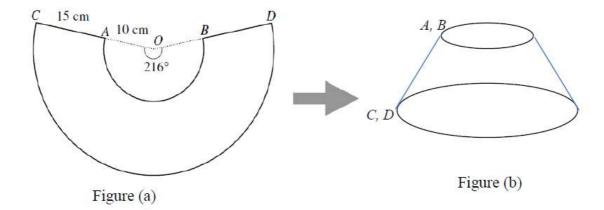
(3 marks)

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3.	In the figure, O , A and B are on the same horizontal ground. A is due s	outh of O and B is due west of O .
	A vertical pole <i>OP</i> stands vertically at <i>O</i> . The angles of elevation of	P from A and B are 48° and 65°
	respectively. The distance between A and B is 120m. (Give your answer	1
	(a) Find the length of <i>OP</i> .	(4 marks)
	(b) Another point C is on the same horizontal ground as O and is 50m	north of <i>B</i> . Find the true bearing
	of A from C .	(3 marks)
	(c) Q is a point which moves along the horizontal line joining A a	
	elevation of P from Q as Q moves along AC .	(4 marks)
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		$B \stackrel{\frown}{\longrightarrow} C$
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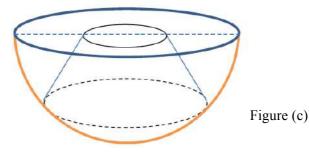
(a) Find the radii of the top and the bottom of the solid.

(3 marks)

(b) Find the volume and the total surface area of the solid frustum in terms of π .

(5 marks)

(c) A hemispherical vessel is held vertically on a horizontal surface. The solid frustum in Figure (b) is then placed inside the vessel with the circular bottom and top faces horizontal as shown in Figure (c). Water is poured to fill up the vessel and just cover the whole frustum. The surface of water and the top face of the frustum are on the same horizontal level. Find the volume of water inside the vessel. (3 marks)



Final Examination 2012-2013
F.3 Mathematics - Paper 1 (Section C)

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