



Coimisiún na Scrúduithe Stáit State Examinations Commission

Leaving Certificate Applied 2013

Mathematical Applications (200 marks)

Friday, 7 June

Morning 9.30 – 11.30

General Directions

1. Write your EXAMINATION NUMBER in this space:
2. Write all answers in the boxes or spaces in this answerbook.
3. Show necessary work on right hand blank page opposite each question.
4. Calculators may be used.
5. Answers involving money should be given correct to the nearest cent, unless otherwise indicated.

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ATTEMPT QUESTION ONE AND THREE OTHER QUESTIONS.
ALL QUESTIONS CARRY EQUAL MARKS.

<i>For the Superintendent only</i>
Centre Stamp

<i>For the Examiner only</i>		
		Question
		Mark
		1
		2
<i>Cumulative check</i>		3
Running total		4
– Disallowed		5
= Total	↔	Total

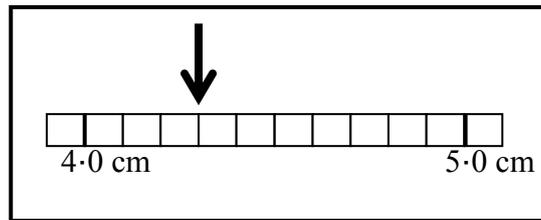
1.

(a) Calculate $\sqrt{215}$, correct to two decimal places.

(b) A house originally priced at €225 000 is reduced by 5%.
What is the new selling price of the house?

(c) An injection uses 15 cm^3 of medicine. How many such injections can be got from 1.8 litres of medicine?

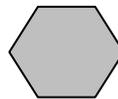
(d) What measurement is the arrow pointing to?



(e) Given an exchange rate of €1 = £0.79 sterling, convert €150 to sterling.

(f) Calculate $1\frac{3}{4} + 2\frac{1}{3}$

(g) A regular hexagon has side of length 7.25 cm.
Find the perimeter of the hexagon.



(h) I lodged three cheques for €34.32, €23.67 and €12.76 in the bank.
How much in total did I lodge?

(i) What is the difference between the largest and the smallest of the following numbers:

0.034, 0.403, 0.304, 0.430, 0.043

(j) A letter is chosen at random from the word ALGEBRA.
What is the probability the letter chosen is an A?

Use this page to show any necessary work for Question 1

2. Research Element question on Approximation and Estimation

(a) This is part of a shopping list for a birthday party. Estimate the costs involved, to the nearest euro.

Quantity	Item	Cost (to the nearest €)
10	Packets of crisps at 72 cent each	
5	Bags of sweets at €1.85 each	
20	Cupcakes at 52 cent each	
12	Sausage Rolls at 37 cent each	

(b) John gave an estimate of €30. Mary said it would be nearer €40.
Which of them gave the best estimate?

(c) The attendance at a football match, when given to the nearest thousand, was 37 000.

(i) What is the maximum number that could have been in attendance?

(ii) What is the minimum number that could have been in attendance?

(d) Round the following to the nearest whole number:

(i) 143.2 (ii) 0.58 (iii) 14.728

(i)

(ii)

(iii)

(f) (i) Write 96.41 to the nearest 10.

(ii) Use your answer to estimate $\sqrt{96 \cdot 41}$.

(i)

(ii)

(g) Round the numbers as indicated in the following:

Lottery Jackpot of €5 116 813 last weekend

The Lottery Jackpot last weekend was over _____ (rounded to nearest million euro).

387 216 people now registered as unemployed

Nearly _____ (rounded to nearest 100 000) people now unemployed.

Inflation in Europe now running at 0.0275

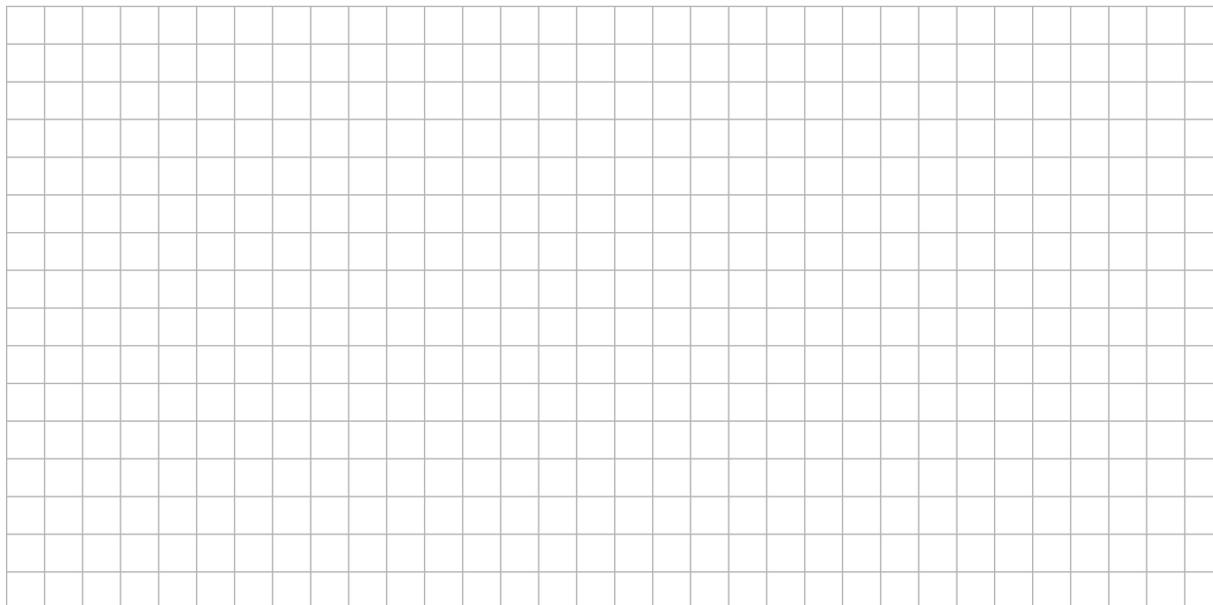
European inflation is now at nearly _____ (rounded to two places of decimals).

Use this page to show any necessary work for Question 2

3. (a) The average monthly temperature for Malta is recorded on the following table:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp(°C)	13	13	15	17	21	25	28	28	26	18	18	15

Draw a trend graph to represent this information.



(b) Calculate the average temperature for June, July and August.

(c) Convert the temperature for July to degrees

Fahrenheit using the formula $F = C \times \frac{9}{5} + 32$

(d) The following is from the Bus Timetable between Dublin and Belfast:

ROUTE	41a	41b	41c
Dublin(Busáras) dep.	1305	1400	1450
Dublin Airport dep.	1320P	1415P	1505P
Newry(Buscentre) arr.	1430D	1525D	1615D
Banbridge(War Memorial) arr.	1450D	1545D	1635D
Sprucefield(Shopping Centre) arr.	1510D	1605D	1655D
Belfast(Glangall Street) arr.	1525	1620	1710

P : - Pick-up stop only. D : - Drop-off stop only.

(i) At what time does the **41c** bus arrive in Belfast?

(ii) How long does it take the **41a** bus to reach Belfast from Dublin?

(iii) The distance from Dublin to Belfast is 170 km.

Calculate the average speed of the **41a** bus, using $S = \frac{D}{T}$

Use this page to show any necessary work for Question 3



4 (a) In the box below, construct a rectangle 8 cm long and 3 cm wide.

(b) The rectangle you have drawn in part (a) is a scaled diagram of a car parking space. The scale is 1:200. Calculate the actual measurements of the car parking space.

Length:

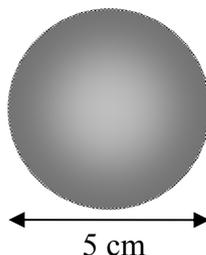
Width:

(c) What is the area of the car parking space?
Give your answer in m^2 .

(d) Tarmacadam costs €16.50 per square metre.
Find the cost of tarmacadam for the car parking space.

(e) €364.32 VAT is added to the cost of the tarmacadam.
Find the percentage rate of VAT that is being used.

(f) A sphere has a diameter of length 5 cm.
Calculate the volume of the sphere,
taking $\pi = 3.14$.



$$\text{Volume of Sphere} = \frac{4}{3} \pi r^3$$

Use this page to show any necessary work for Question 4

5. (a) Write out the list of all possible two-digit numbers that can be made using the digits 2, 3, 4.

One possible number is 42.

These two-digit numbers are used on raffle tickets.
The tickets are placed in a bag.

(b) One ticket is chosen at random. What is the probability that the number on the ticket chosen is an odd number?

(c) This ticket is replaced, and a ticket is again drawn at random. What is the probability that the number on the ticket chosen is less than 40?

Michelle has a gross salary of €28 500 per year.

(d) Tax is paid at 21% .
Calculate Michelle's gross tax.

(e) Michelle has a tax credit of €3340 per year.
How much tax does she pay?

(f) The Universal Social Charge (USC) is calculated using the following chart.

Fill in the missing details to calculate Michelle's USC .

Income	% USC	USC
€0 - €10036	2%	€200.72
€10036 - €16016	4%	€239.20
Earnings over €16016	7%	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 0 auto;"></div>
Total USC payable		<div style="border: 1px solid black; width: 100px; height: 20px; margin: 0 auto;"></div>

Use this page to show any necessary work for Question 5

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