



Coimisiún na Scrúduithe Stáit State Examinations Commission

Leaving Certificate Applied, 2010

Mathematical Applications (200 marks)

Friday, 11 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.

ATTEMPT QUESTION ONE AND THREE OTHER QUESTIONS.

ALL QUESTIONS CARRY EQUAL MARKS.

<i>For the Superintendent only</i>	<i>For the Examiner only</i>	
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p><i>Centre Stamp</i></p> </div>	1. Cumulative end-of-page total.	
	2. Aggregate total of all disallowed questions.	
	3. Total mark awarded. (1 minus 2)	
	4. Bonus mark for answering through Irish (if applicable).	
	5. Total mark awarded if Irish Bonus. (3 + 4)	
	Note: The mark in row 3 (or row 5 if an Irish bonus is awarded) must equal the mark in the <i>Grand Total</i> box on the inside flap.	

1. (a) Calculate $\sqrt{39 \cdot 3}$, correct to one decimal place.

(b) Find the cost of 18 cans of soft drinks, if a six-pack costs €2.49.

(c) Add $\frac{5}{7} + \frac{3}{14}$.

(d) In a sale all items are reduced by 20%.
During the sale a sweatshirt sells for €31.12.
Calculate the cost of the sweatshirt before the sale.

(e) A letter is chosen at random from the word LEITRIM.
What is the probability that the letter chosen is an I?

(f) Given an exchange rate of €1 = £0.91 sterling,
convert €255 into sterling.

(g) Convert 59° Fahrenheit to degrees Celsius,
using the formula $C = \frac{5}{9}(F - 32)$.

(h) Sean has the same number of 20c coins as 5c coins.
The total is €5.
How many of each type of coin does he have?

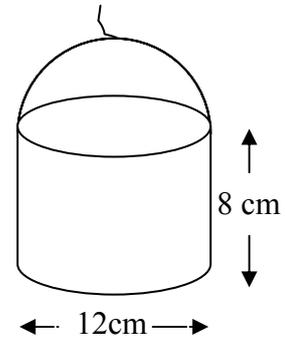
(i) Add 330 m and 110 cm and express your
answer in metres.

(j) A journey begins at 11:25 and ends at 13:10.
How long does the journey take?

Use this page to show any necessary work for Question 1

2. Research Element Question on Length, Area and Volume.

The diagram shows a candle in the shape of a cylinder with a hemisphere on top.



- (a) Calculate the volume of the cylinder, taking $\pi = 3.14$.

$$\text{Volume of a Cylinder} = \pi r^2 h$$

- (b) Calculate the volume of the hemisphere, taking $\pi = 3.14$.

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

- (c) A rectangular block of wax measuring $14 \text{ cm} \times 14 \text{ cm} \times 8 \text{ cm}$ is melted down to make the candle.
Calculate the amount of wax left over.

- (d) Construct a triangle in which one side is 4 cm, another side is 3 cm and the angle between these two sides is 90° .

Measure the length of the third side.

Length of third side =

- (e) Use the measurement of the three sides of your triangle to check the theorem of Pythagoras which states: 'In a right angled triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides.'

Use this page to show any necessary work for Question 2

3. (a) A die is thrown.

(i) Write out all possible outcomes.

(ii) What is the probability of getting a 4?

(iii) How often would you expect to get a 4 if the die was thrown 300 times?

(b) Ken wants to calculate his BMI (Body Mass Index).
Ken's height is 1.68 m and his weight is 76.2 kg.

Description	BMI
Underweight	< 17.9
Normal	18 to 25
Overweight	25.1 to 29.9
Moderately obese	30 to 40
Severely obese	> 40

(i) Calculate Ken's BMI .

$$\text{BMI} = \frac{\text{weight(kg)}}{[\text{height(m)}]^2}$$

(ii) Consult the table above to describe Ken's weight.

(iii) Calculate the amount of weight that Ken should lose in order to have a BMI reading of 25.

Use this page to show any necessary work for Question 3

4. The final accounts for a mini-company are shown below.

Final Accounts of <i>The Valentine's Card Company</i> on 31st May 2010			
SHARES SUMMARY	Number of Shares issued	Income	Expenditure
EACH STUDENT GETS 12 FREE SHARES	72	€0.00	
EACH STUDENT BUYS A FURTHER 5 SHARES AT A REDUCED COST OF 20 CENT EACH	<input type="text"/>	€6.00	
EACH STUDENT SELLS A FURTHER 5 SHARES AT THE FULL PRICE OF 40 CENT EACH	30	€12.00	
TOTAL SHARES ISSUED	132	<input type="text"/>	
<u>Purchases</u>			
500 BLANK A4 CARDS @ 5 cent each			€ 25.00
INK FOR PRINTER			€31.80
500 ENVELOPES @ 4 cent each			€20.00
TOTAL PURCHASES			€76.80
<u>Sales</u>			
406 CARDS SOLD AT 45 CENT EACH		<input type="text"/>	
TOTAL SALES		<input type="text"/>	
GRAND TOTALS ON 31 MAY 2010		<input type="text"/>	€76.80

(a) Fill in the five missing details on the Final Accounts above.

(b) Calculate the total profit of the company on the 31 May 2010, (the final date).

(c) Calculate the Final Share Value of the company.

$$\text{Final Share Value} = \frac{\text{Total profit}}{\text{Total number of shares issued}}$$

(d) A teacher bought ten shares in the company. Calculate the profit the teacher made.

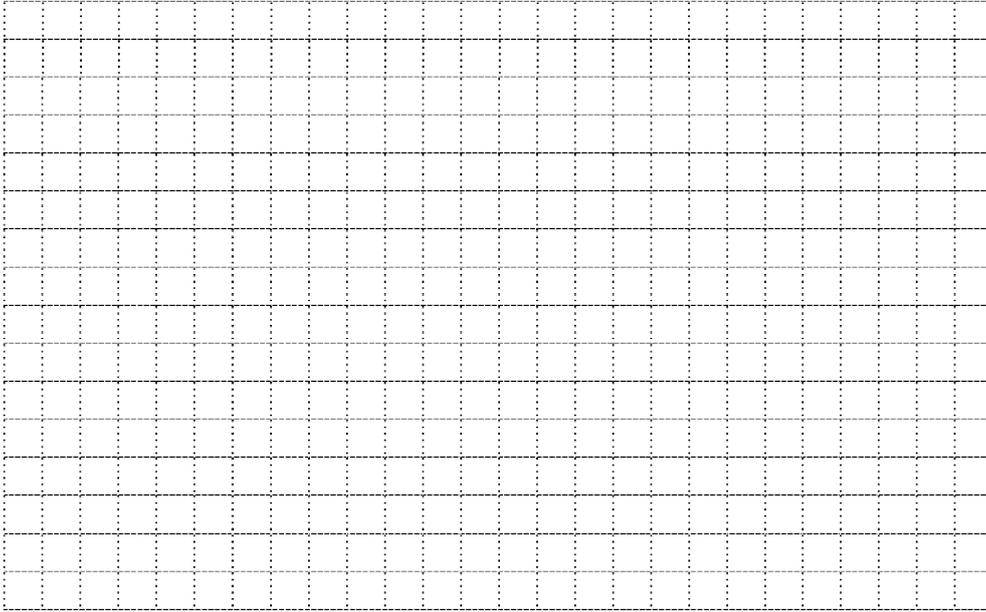
(e) If all the 500 cards were sold calculate the percentage increase in the total profit.

Use this page to show any necessary work for Question 4

5. The table below shows successive two-monthly electricity bills for a household over the course of a year, in euro.

Period	Jan/Feb	Mar/Apr	May/Jun	Jul/Aug	Sep/Oct	Nov/Dec
Bill (€)	220	165	135	120	140	215

- (a) Draw a bar chart on the grid below, to illustrate this data.



- (b) Calculate the average two-monthly bill, correct to the nearest euro.
Show your work on the page opposite.

Peter works in the local Mantra Supermarket.
He is paid a basic hourly rate of €9.80 for a 37 hour week.
He is paid time and a half for overtime.

- (c) Last week Peter worked 40.5 hours.
Fill in the table below to calculate his gross earnings for last week.

Standard Week 37 hrs @ € 9.80	= € <input style="width: 100px; height: 20px;" type="text"/>
Overtime <input style="width: 40px; height: 20px;" type="text"/> hrs @ € <input style="width: 40px; height: 20px;" type="text"/>	= € <input style="width: 100px; height: 20px;" type="text"/>
Gross Earnings	= € <input style="width: 100px; height: 20px;" type="text"/>

Use this page to show any necessary work for Question 5

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For the examiner only

Question	Mark
1	
2	
3	
4	
5	
Total	
Irish Bonus	
Grand Total	