



Coimisiún na Scrúduithe Stáit State Examinations Commission

Leaving Certificate Applied 2021

Mathematical Applications

(200 marks)

Friday 11 June
Morning 9:30 to 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 all necessary work in the space provided.
4. Calculators may be used.
5. Answers involving money should be given correct to the nearest cent, unless otherwise indicated.

ANSWER QUESTION ONE AND THREE OTHER QUESTIONS.

ALL QUESTIONS CARRY EQUAL MARKS.

<i>For the superintendent only</i>		<i>For the examiner only</i>			
Centre stamp				Question	Mark
				1	
				2	
				3	
				4	
				5	
		<i>Cumulative check</i>			
Running Total					
– Disallowed					
= Total					
				↔	
				Total	

Credit

Question 1

- (a)** Find the square root of 144.

[illegible]

- (b)** Write these three numbers in order of size, starting with the smallest.

$$71\% \quad \frac{3}{4} \quad 0.079$$

Answer: , ,

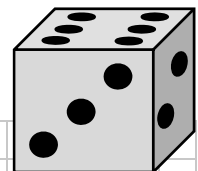
- (c) The cost of a meal is divided evenly between four people. Each person pays €34.40. Work out the **total** cost of the meal.

[illegible]

- (d)** How many 125 ml portions of juice can be served from a bottle containing 1 litre?

[illegible]

- (e)** Michelle rolls a regular 6-sided fair die.
What is the probability that she gets a 4 or a 5?



Answer:

- (f)** What number, when multiplied by 3.9 , is equal to 46.8 ?

Answer:

- (g) What is the **least** number of coins that need to be used to make exactly €2.39?

Answer:

- (h)** A supermarket has a special offer as follows:

Apples: 50 cent each. Buy 5 for €2

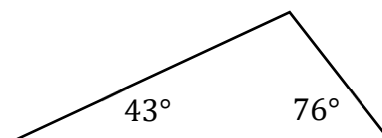
Work out the total cost of 8 apples, using this special offer.

Answer:

- (i) Rory runs 5 km in 20 minutes.
Work out Rory's average **speed**, in kilometres per hour.

[illegible]

- (j) Two of the angles in a triangle measure 43° and 76° .
Work out the size of the third angle in the triangle.

[illegible]

Question 2: Research Element Question on Holiday and Travel Mathematics

The Lopez family (two adults and two children) have won a prize of 6 nights' B&B in a hotel in London.

- (a) They will fly from Shannon to London. Their flight leaves Shannon at 16:30.
- (i) Their flight takes 1 hour and 25 minutes. At what time will it arrive in London?

																				Answer:									
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- (ii) They plan to be in the airport 2 hours before their flight leaves at 16:30. It will take them 45 minutes to travel from their home to the airport. What is the latest time they can leave home?

																				Answer:									
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- (b) The tables below shows the costs of some flights (per person) from 23rd December to 12th January.

Depart (Shannon to London)						
December						
M	T	W	T	F	S	S
23rd €78	24th €89	25th €89	26th €98	27th €45	28th €25	29th €35
30th €56	31st €45					

Return (London to Shannon)						
January						
M	T	W	T	F	S	S
		1st €78	2nd €67	3rd €57	4th €67	5th €67
6th €69	7th €67	8th €78	9th €89	10th €80	11th €45	12th €45

The Lopez family will fly home 6 days after they fly to London. The earliest they can fly to London is 28th December. The latest they can fly home is 5th January.

This means that they have three options for the dates when they can fly.

Use the prices in the tables above to fill in the missing values in the table below, showing the cost of the flights (per person) for each option.

Option	Departure date	Return date (6 days later)	Total cost of flights (per person)
Option 1	28th December	3rd January	
Option 2			
Option 3			

- (c)** The Lopez family must also pay transfer fees of €55 for the family, plus travel insurance fees of €17 per person.

Work out how much these fees will cost the Lopez family (two adults and two children).

Answer:

- (d)** Mrs Lopez wants to convert €350 to pounds sterling.

- (i) The exchange rate is €1 = £0.91 pounds sterling.
Use this exchange rate to convert €350 to pounds sterling.

Answer:

- (ii) Mrs Lopez is charged 1.1% commission to convert her €350. Work out how much money she will get in pounds sterling, after the commission has been deducted.

Answer:

- (e) The temperature in London is 50°F .

Use the appropriate formula below to convert this temperature into degrees Celsius.

<p>Celsius to Fahrenheit</p> $F = \frac{9}{5}C + 32$	<p>Fahrenheit to Celsius</p> $C = \frac{5}{9}(F - 32)$
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[illegible]

(a) Complete Emma's Weekly Budget by writing each item in her Income and Expenses list into the correct column, **and** finding her total income and total expenses.

Weekly Budget			
Income		Expenses	
	€		€
		Bills	50
Total:		Total:	

- | | |
|--|---------|
| | Answer: |
|--|---------|

Most Expensive	Least Expensive
€548 008 South Dublin County	Roscommon €128 090
€373 798 South Dublin City	Sligo €125 560
€309 887 North Dublin City	Leitrim €121 093
€295 245 Wicklow	Longford €116 843

- Answer:

- (d) What was average cost of a house in **Sligo** in 2017, correct to the nearest €1000?

Answer:

- (e) What was the **difference** between the average cost of a house in the most expensive area and the least expensive area?

Answer:

Saoirse and Nassar are saving to buy a house. Between them, they save €400 per **month**.

- (f) They need a deposit of €19 200.
For how many **years** will they have to save in order to have this deposit saved?

Answer:

- (g) Saoirse and Nassar save the deposit of €19 200.
This deposit is **10%** of the total value of the house.

Work out the total value of the house, **and** the amount they will need to borrow to buy the house (the total value of the house minus the deposit).

Total value of the house = €

Amount they need to borrow = €

Question 4

Abel works as a graphic designer.

The table below shows the hours he worked one weekend.

His basic pay is €**23** per hour.

Day	Friday	Saturday	Sunday
Number of hours worked	7	8	8

- (a)** How much money did Abel earn in **total** for working on Friday and Saturday?

[illegible]

- (b)** Abel is paid time and a half for Sunday.
How much did he earn for working on Sunday?

[illegible]

Abel's gross income was €2576 last month.

He pays tax at a rate of 20%.

- (c) Work out Abel's **gross tax** for the month.

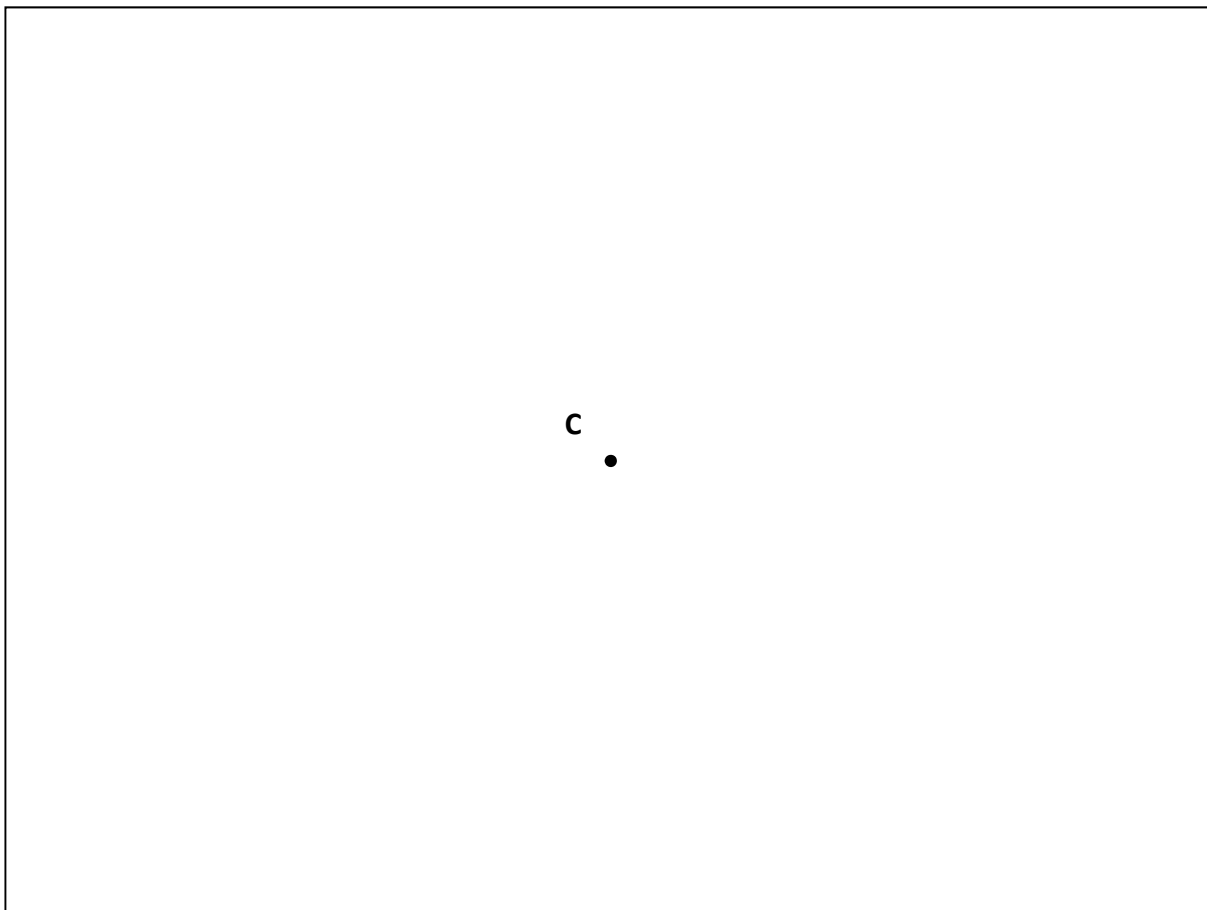
[illegible]

Abel's monthly Tax Credit is €466.67.

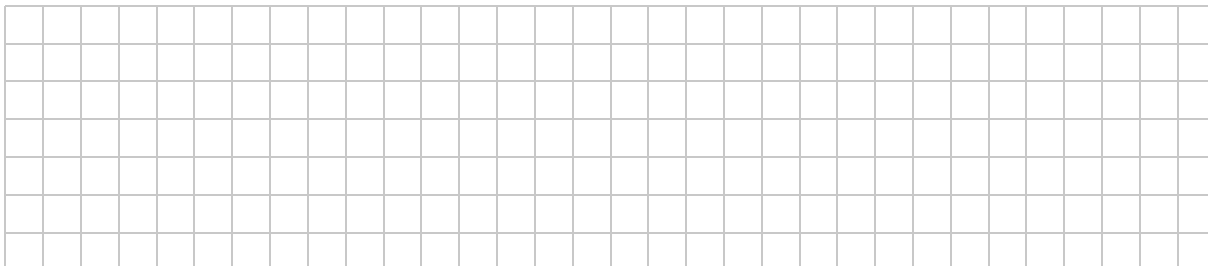
- (d)** Work out Abel's **net income** for the month.

Answer:

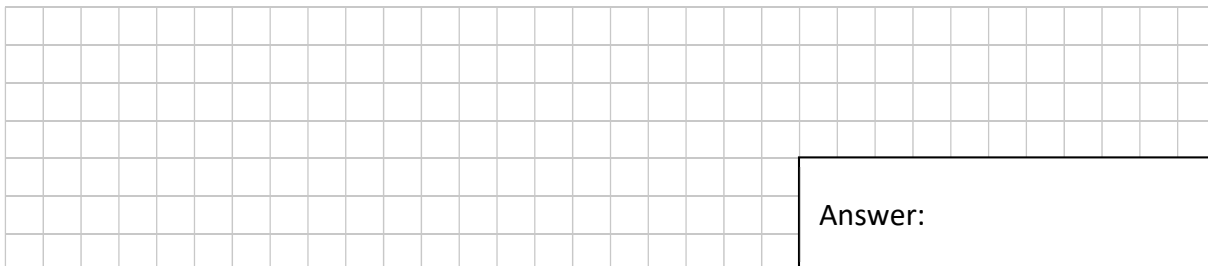
- (e) Construct a circle with radius 5 cm in the space below, using the point **C** as the centre.



- (f) Diane has a circular lawn with a radius of 5 m.
Show that the **area** of this lawn is 79 m^2 , correct to the nearest square metre.



- (g) Diane covers the lawn with grass seed. A bag of grass seed costs €8.99 and covers 40 m^2 .
Work out the cost of buying enough bags of grass seed to cover the lawn.

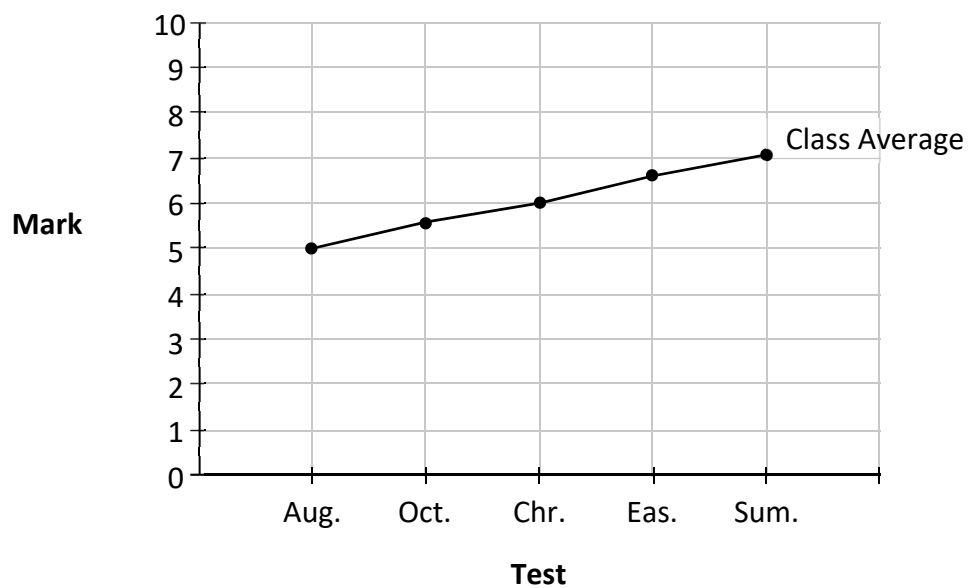


Question 5

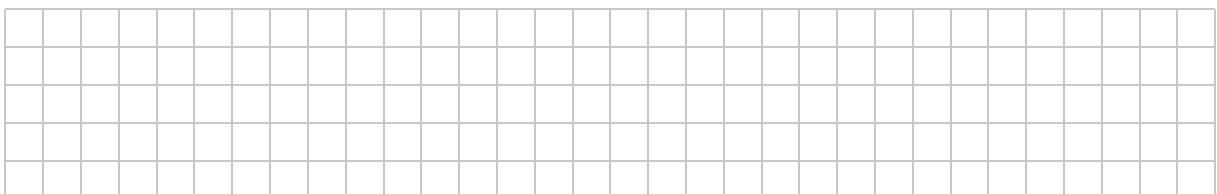
The table below shows the mark that each student in a class got in a series of tests taken over the school year. Each test was marked out of 10.

		Test				
		August	October	Christmas	Easter	Summer
Student	John	8	7	5	2	1
	Angela	4	5	7	9	9
	Bill	1	3	5	7	9
	Evan	7	5	4	3	2
	Frank	9	9	8	9	10
	Aileen	4	6	7	9	10
	Michelle	2	4	6	7	9

The trend graph below shows the **class average** (mean) mark for each test.



- (a) On the diagram above, **draw** a trend graph to show **John's** marks in the tests over the year.



- (b)** Based on your graph, how does John's performance over the school year compare to the average performance of the class, on these tests?

[illegible]

- (c) Name another student whose marks had a similar trend to John's over the school year.

Answer:

- (d) Write down **Angela's modal** mark for the 5 tests.

Mode:

- (e) Work out **Aileen's mean** (average) mark for the 5 tests.

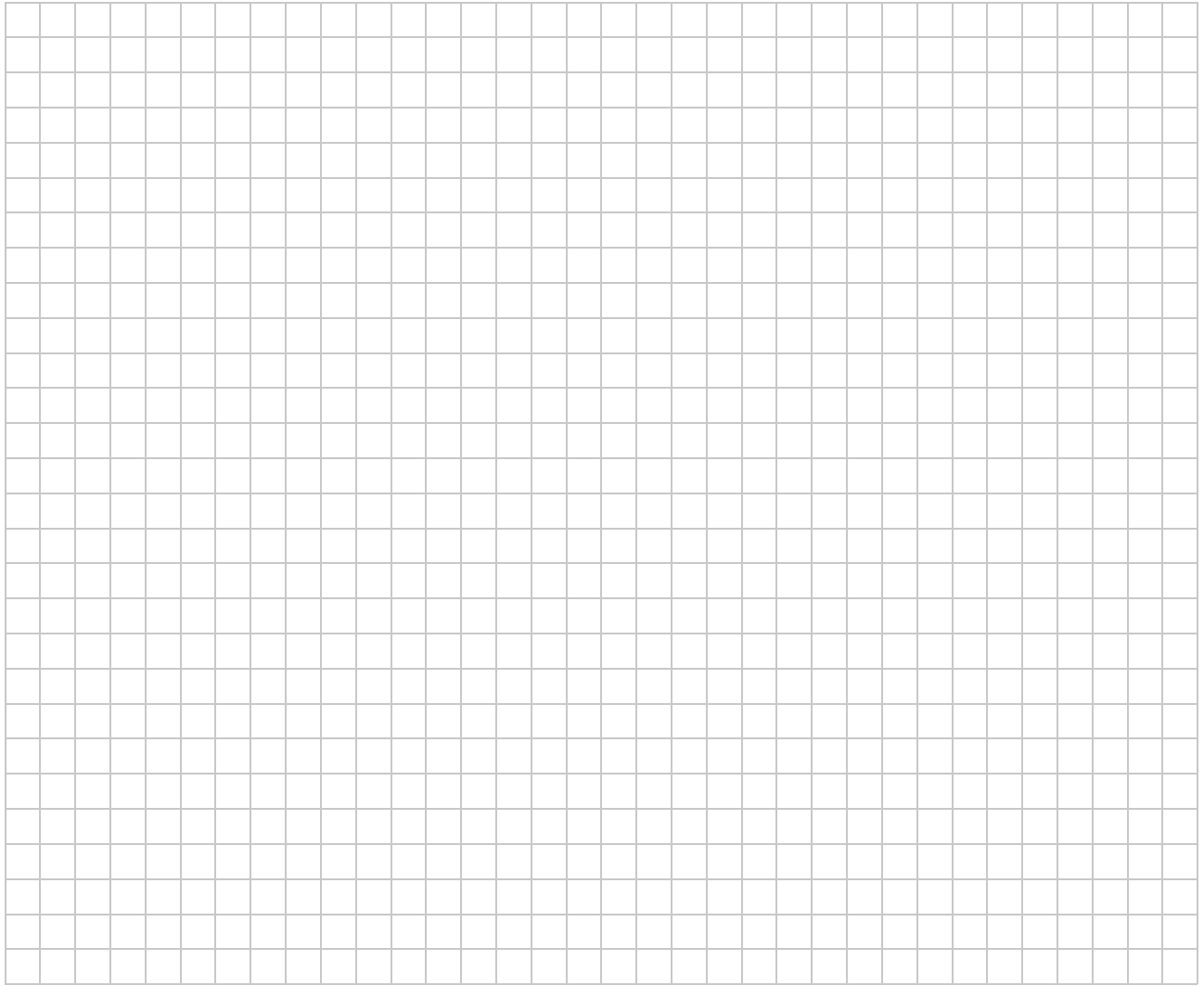
Answer:

- (f)** Pete's Mini-Company are having an election for CEO. There are 12 shareholders who vote in this election. Pete needs $50\% + 1$ of the votes to become the CEO. How many votes must Pete get in order to become CEO?

[illegible]

- (g)** The Mini-Company has total sales of €1100 and total costs of €800.
Work out the **percentage profit** of the Mini-Company (profit as a percentage of cost).

Answer:



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