Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Applied 2019

Mathematical Applications

(200 marks)

Friday 7 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.

For the superintendent only
Centre stamp

For the examiner only				
			Question	Mark
			1	
			2	
Cumulative check			3	
Running Total			4	
– Disallowed			5	
= Total		↔	Total	

Credit

Question 1

(a) Roy is paid €11 per hour for babysitting. He babysits from 9 p.m. on Saturday night until 2 a.m. on Sunday morning. Work out how much he earns.

Answer:

(b) Helen was born in 1996. Her brother Cian was born 2 years and 3 months later.
In which two years could Cian have been born?

Answer: or

(c) A football pitch is 140 m long and 80 m wide.
Work out the length of the perimeter of the pitch.

Answer:

(d) The speed limit in a city is 50 km per hour. Pawel drives 10 km in this city, without breaking the speed limit. What is the least amount of time, in minutes, this would take?

Answer:

(e) Work out the value of $(1{\cdot}7)^3$.

Answer:

(f) Add 50 g, 200 g, and 3 kg. Give your answer in kg.

Answer:

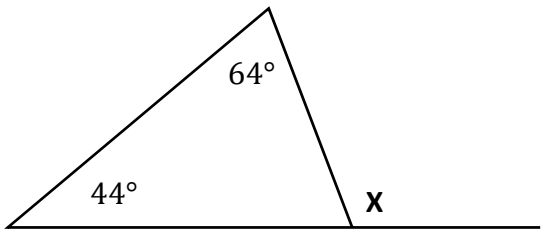
(g) How many complete injections of 15 cc can be taken from a full 1 litre bottle (1000 cc)?

Answer:

(h) Alicia buys a guitar for €400, and sells it for €450. Find her percentage profit.

Answer:

(i) Work out the size of the angle **X** in the diagram below.



Answer:

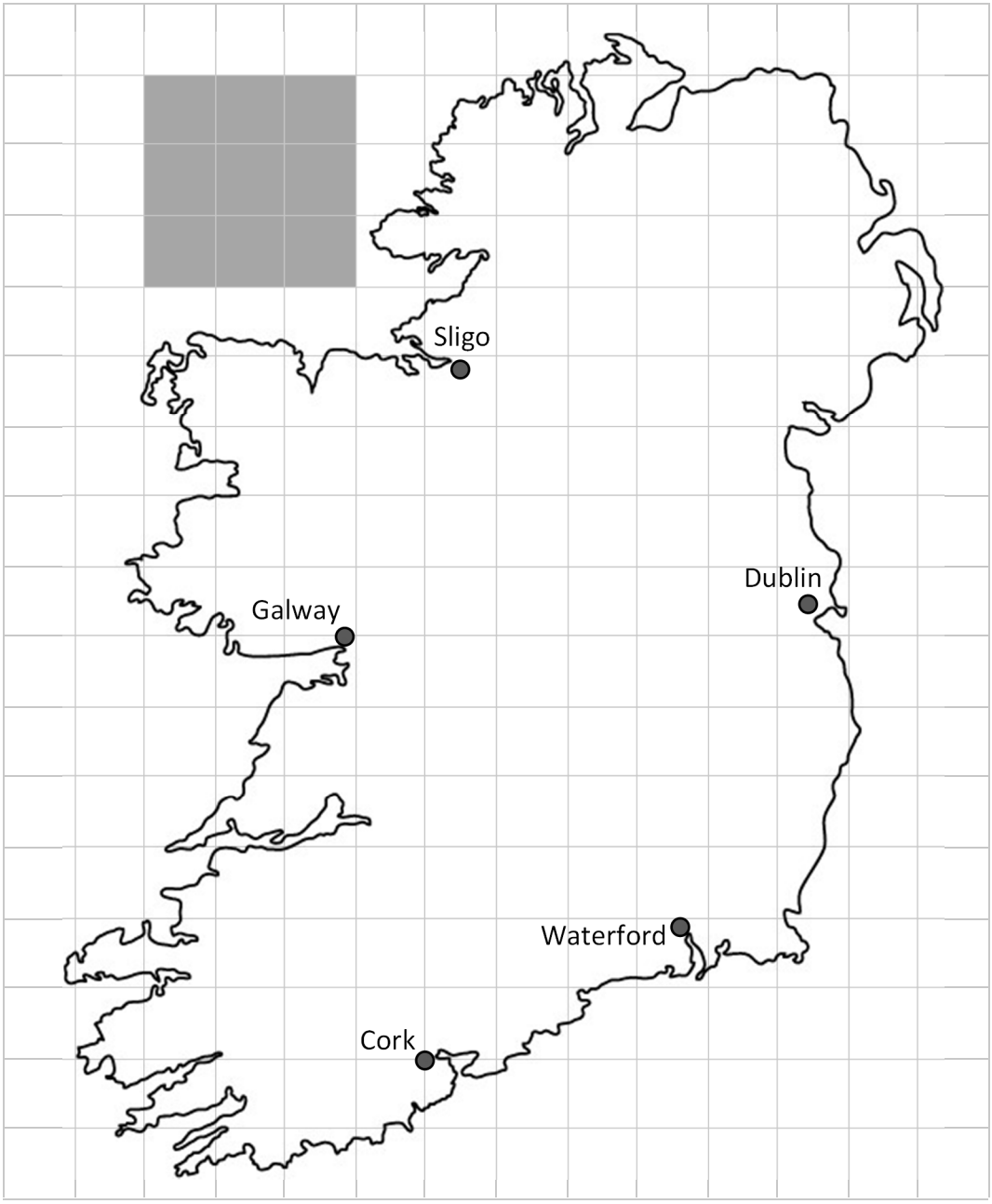
(j) A prize of €200 is divided between Harry and Fergie in the ratio $2 : 3$.
Work out how much money each person gets.

Harry gets:	Fergie gets:

Question 2: Research Element Question on Scale

The diagram below shows a map of Ireland on a grid. Each small square on the grid has a side of length 1 cm. Some places on the map are marked. A shaded square is also shown.

Use the diagram to answer the questions that follow.



The map is to a scale of $\mathbf{1\ cm = 30\ km}$.

(a) (i) Write down the length of the side of the shaded square on the map (in cm), and the actual length of the side of the square (in km).

Length on the map: _____ cm **Actual Length**: _____ km

The shaded square represents an Oil Exploration Area.

(ii) Work out the **actual area** of this Oil Exploration Area, in km^2.

Answer:

(iii) An exploration licence costs €9122, plus €91 per km^2.
Work out the cost of this licence for this Oil Exploration Area.

Answer:

(b) Ciarán wants to live within 60 km of Cork. Construct an arc of a circle on the diagram to show where Ciarán could live. Remember that the map is to a scale of 1 cm = 30 km.

(c) Which is closest to Dublin: Sligo, Galway, or Waterford? Justify your answer with work on the diagram, or by taking measurements and writing them down.

Closest to Dublin:	Sligo	Galway	Waterford
(tick (✓) **one** box only)	☐	☐	☐

(d) Mia drove from Dublin to Galway by the shortest route possible. It took Mia 2·5 hours.

By measuring the distance from Dublin to Galway on the diagram, estimate Mia's average speed in km per hour. Show your working out.

Answer:

Question 3

Runway Railways plan to operate a service from Dublin to Belfast using the following timetable.

		Train **A**	Train **B**	Train **C**
Dublin	Depart	07:35	11:20	16:30
Drogheda	Depart	08:09	11:56	17:10
Dundalk	Depart	08:31	12:18	17:30
Newry	Depart	08:48	12:36	18:11
Belfast	Arrive	09:45	13:35	19:09

(a) At what time would the latest train leave Dublin?

Answer:

(b) How many minutes would it take Train **B** to get from Dundalk to Newry?

Answer:

(c) Which train would take the least amount of time to get from Dublin to Belfast: **A**, **B**, or **C**? Show all your working out.

Answer:

(d) Mckenzie changed €200 into £ sterling. The exchange rate was £1 sterling = €1·27. How much money did Mckenzie get, in £ sterling?

Answer: £

(e) The table below shows the fares for a different train company.

(i) Write down the cost of a single ticket from Dundalk to Belfast.

Answer:

(ii) Mckenzie bought a single ticket. She paid €20, and got €8 change.

Which train could Mckenzie have been buying a ticket for?

From:
To:

	Connolly	Laytown	Drogheda	Dundalk
Newry	F	C	C	A
Portadown	G	D	D	B
Lisburn	J	F	F	D
Belfast	K	G	F	D

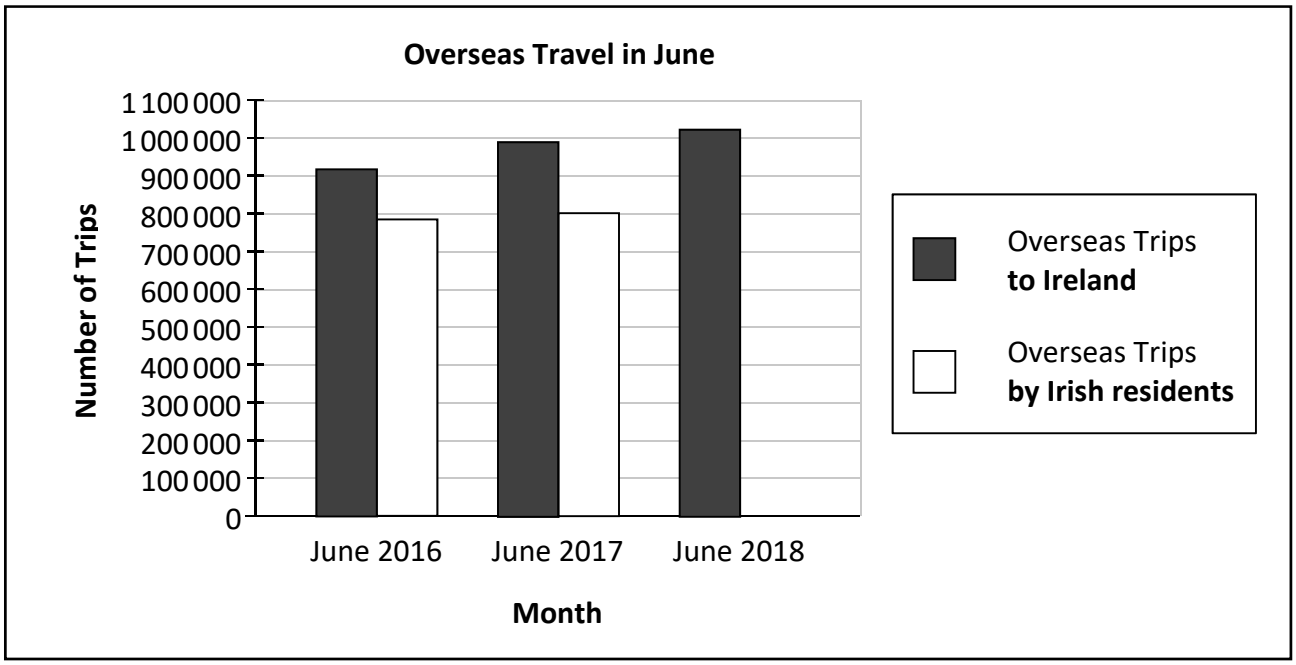
Key: Single Ticket (€)							
A	B	C	D	F	G	J	K
9	12	16	19	27	29	35	38

(f) Fill in the missing numbers labelled **A**, **B, C**, and **D** in the gas bill below.

Natural Gas Bill				
Meter Readings		Conversion		Gas used
Present	Previous	Units	× Conv. Factor	kWh
19101	18983 E	**A.**	× 10.8173	1276
			€	
Standing Charge €0.22659 per day for 64 days			14.50	
Unit Rate €0.05132 per kWh for 1,276 kWh			65.48	
Carbon Tax €0.0037 per kWh for 1,276 kWh			**B.**	
Total excluding VAT			84.70	
VAT @ 13.5%			**C.**	
Total including VAT			**D.**	

Question 4

The graph below shows the number of overseas trips to Ireland, and the number of overseas trips by Irish residents, in June of each year from 2016 to 2018.



(a) Roughly how many overseas trips **to Ireland** were there in June **2016**?

Answer:

(b) The number of overseas trips **by Irish residents** in June 2018 was $878\,500$.
Draw a bar to represent this in the appropriate place on the graph.

(c) Describe the trend in the number of overseas trips **to Ireland** in June, from 2016 to 2018.

(d) In June 2017, the number of overseas trips to Ireland was $992\,700$.
By June 2018, the number of these trips had increased by $3{\cdot}4\%$.

Work out the number of these trips in June 2018.

Answer:

(e) In June 2017, of the 992 700 trips to Ireland, 309 300 were from the UK.
Write the number of trips from the UK as a **percentage** of the total number of trips to Ireland. Give your answer correct to one decimal place.

Answer:

The table below shows the mean (average) monthly temperatures at Markree Castle from May to October in 2018. Each figure is given correct to the nearest ℃.

Month	May	Jun	Jul	Aug	Sep	Oct
Mean temperature (℃)	12	15	15	14	11	9

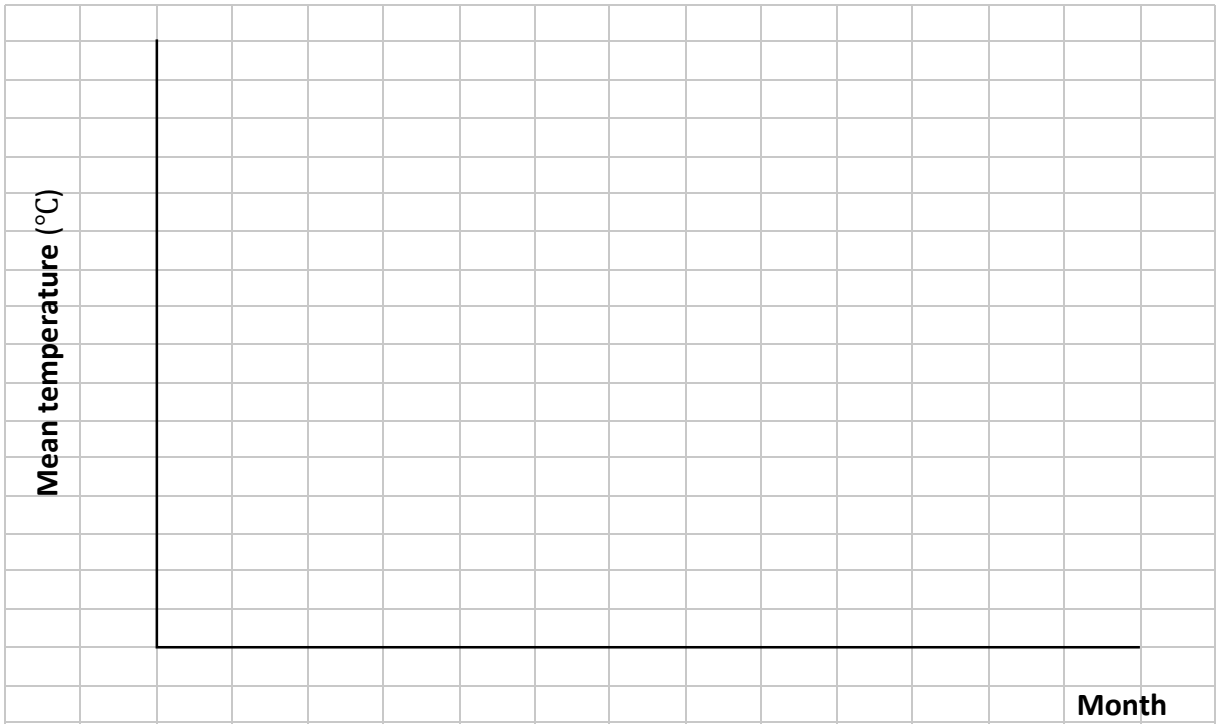
(f) Work out the difference between the highest and the lowest temperatures in the table.

Answer:

(g) Work out the **mean** of the six temperatures in the table, correct to 1 decimal place.

Answer:

(h) Draw a graph on the axes below to show the information in the table.



Question 5

Patricia's Mini Company holds a raffle. The prizes are:

- one prize of €100
- three prizes of €20 each.

They sell **120 tickets** in total for the raffle.

(a) John buys one ticket.

(i) Write down the probability that John wins the €100 prize. Give your answer as a fraction.

Answer: $\frac{\quad}{\quad}$

(ii) Work out the probability that John wins one of €20 prizes. Give your answer as a percentage.

Answer:

(b) Aoife buys a number of tickets for the raffle.

The probability that Aoife wins the €100 prize is $\frac{1}{12}$.

Work out how many tickets Aoife buys.

Answer:

(c) **(i)** Each ticket is sold for €2.

Work out the total amount of money the Mini Company makes from selling the tickets.

Answer:

(ii) It costs €10 to print the tickets. Work out the total cost of running the raffle, including both the printing and the prizes.

Answer:

(iii) There are 4 people in the Mini Company, including Patricia. They divide the profit so that Patricia gets twice as much as each of the other 3 people.

Work out the **total profit**, and how much money **Patricia** gets from the profit.

Total profit:	Patricia's profit:

Two shops have special offers on tins of *Pure White* paint, as shown below.

Pam's Paint	**Barry's Builders**
€40 per tin. Get 3 tins for the price of 2.	€34 per tin. Special offer: 25% off
	

(d) Jim buys 6 tins of *Pure White* paint. Work out which shop will be cheaper for the 6 tins. Show your working out.

The cheaper shop for 6 tins is: (tick (✓) **one** box only)

Pam's Paint ☐ Barry's Builders ☐

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