



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

*Leaving Certificate Applied 2023*

# Mathematical Applications

(200 marks)

**Friday 9 June**

**Morning 9:30 to 11:30**

## General Directions

- Write your EXAMINATION NUMBER in this space:
- Write all answers in the boxes or spaces in this answerbook.
- Show all supporting work in the space provided.
- Include the appropriate units of measurement in your answer, where relevant.
- Calculators may be used.
- A copy of the *Formulae and Tables* booklet is available from the superintendent.
- There are 7 questions on this examination paper. Answer **all** questions. Questions do not necessarily carry equal marks.

<i>For Superintendent</i>	
Centre Stamp	

<i>For Examiner</i>	
Running Total	
Credit	

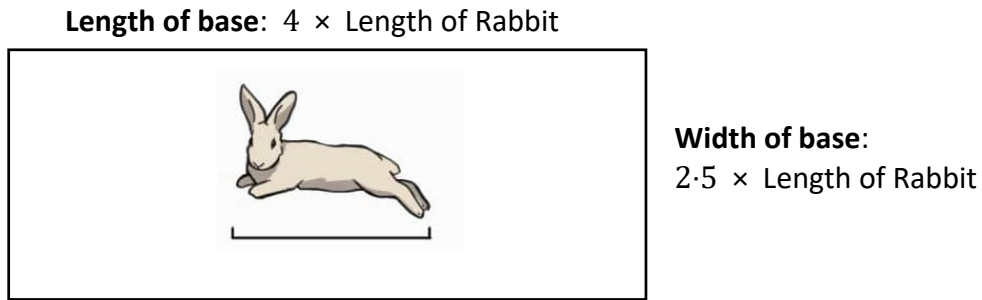
<i>For Examiner</i>		
Q	Ex.	Adv. Ex.
1		
2		
3		
4		
5		
6		
7		
Total		





**Question 2**

Ellie is considering buying a rabbit. She carries out some research on caring for rabbits. She plans to keep her rabbit in a hutch in the shape of a cuboid. The image below contains information about the minimum dimensions of the base of the hutch required by rabbits.

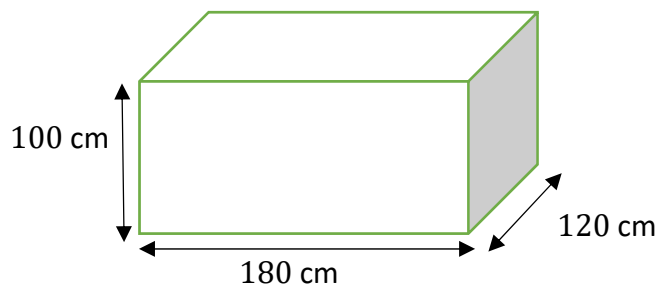


- (a) Ellie is going to buy a fully-grown rabbit that is 32.4 cm long. Work out the **minimum length and width** of the base of the hutch required for a rabbit of this size.

Give your answers in centimetres.

Length: _____	Width: _____
---------------	--------------

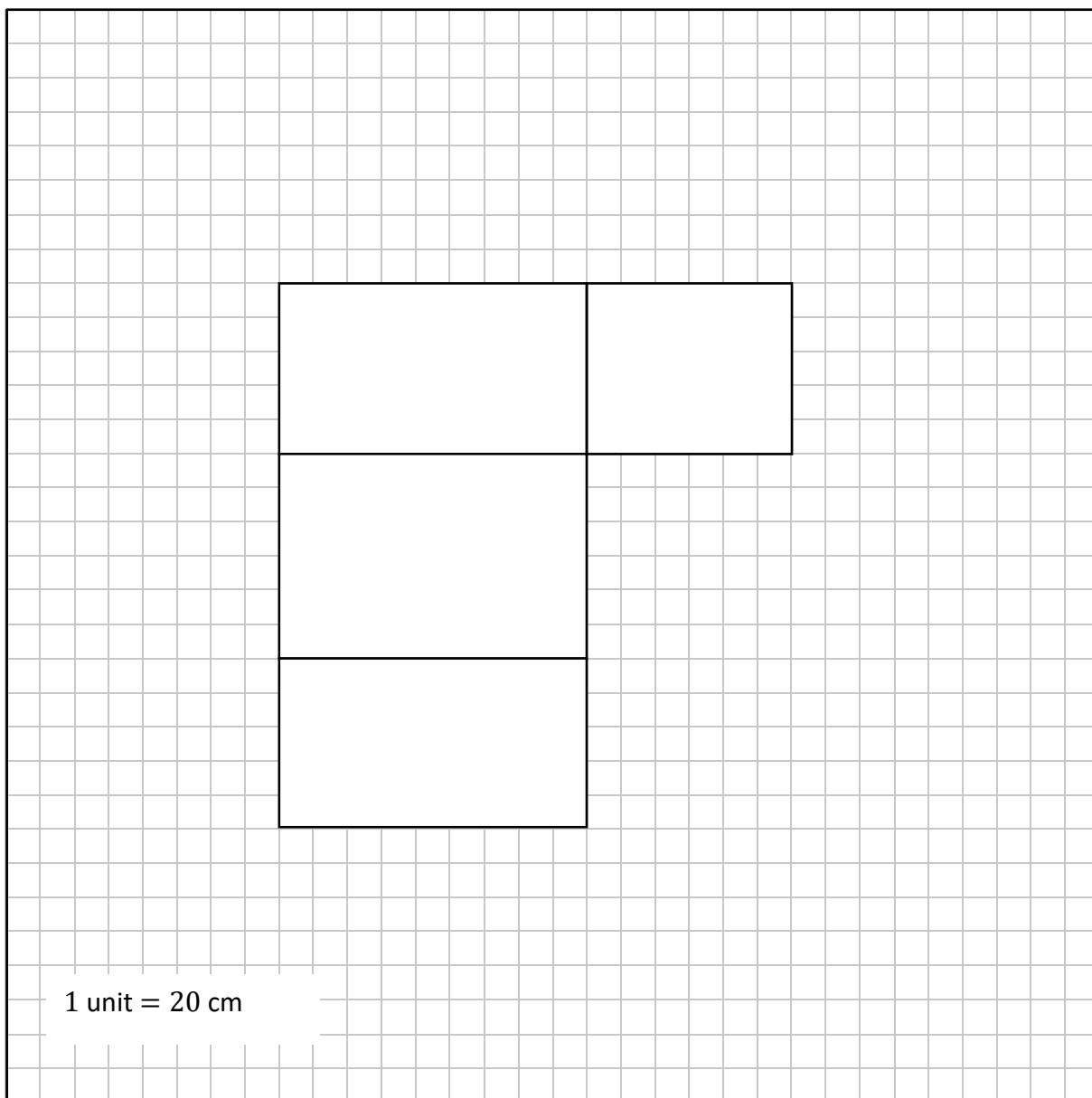
- (b) Ellie decides to buy a hutch in the shape of a cuboid of length 180 cm, width 120 cm, and height 100 cm.



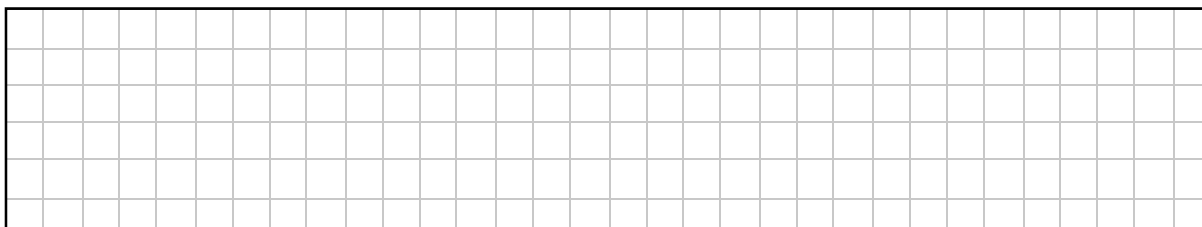
- (i) Work out the **volume** of the hutch.

--

- (ii) Complete the **net** of the rabbit hutch in the space provided below, as accurately as you can. There are 6 faces. Four of the faces are already drawn for you.



- (iii) The original cost of this hutch was €189.99. This was **reduced by 21%** in a sale. Work out the sale price of the hutch. Give your answer correct to the nearest euro.

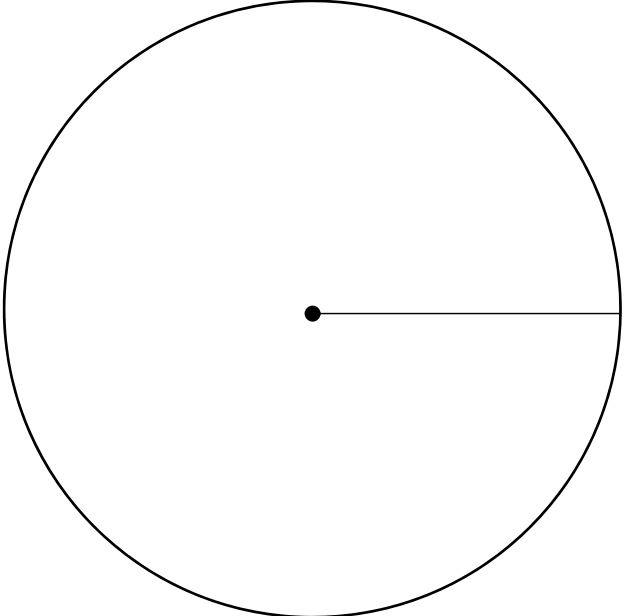


**Question 3**

Emma carried out a survey to find out how students in her school feel about changing from 40 minute classes to 1-hour classes. She selected a sample of 30 students to take part in the survey. The responses she received are listed in the table below.

Response	Frequency
In favour of change	15
Not in favour of change	6
Undecided	9

- (a) Complete the **pie chart** below to show the data in the table above. Label each sector **and** the size of the angle clearly.

<p>Work out the degrees for each sector. Show your working out:</p>	
---	---



#### Question 4

A group of 5th year students are planning a class trip for **74 students**. They are exploring two different venues: a Trampoline Park and a Climbing Centre.

The cost for each activity is listed below. The Trampoline Park charges a rate per person, while the charge for the Climbing Centre is based on the number of instructors required.

Trampoline Park	Climbing Centre
90 mins Bouncing <b>€11 per person</b>	90 minutes Climbing <b>€60 per instructor</b> Each instructor can take up to <b>6</b> students

(a) (i) Work out the cost of a trip for 74 students to the **Trampoline Park**.

(ii) Show that the cost of a trip for 74 students to the **Climbing Centre** is €780.

The students decide to visit the Climbing Centre. Some additional information about the trip is listed in the table below.

<ul style="list-style-type: none"><li>• Climbing gloves are compulsory and cost an additional €2 per person</li><li>• The students will receive a donation of €170 from the Parents' Association towards the cost of their trip</li><li>• Transport to and from the venue will cost €350 in total</li><li>• The students hosted a bake sale and raised €182</li></ul>
---



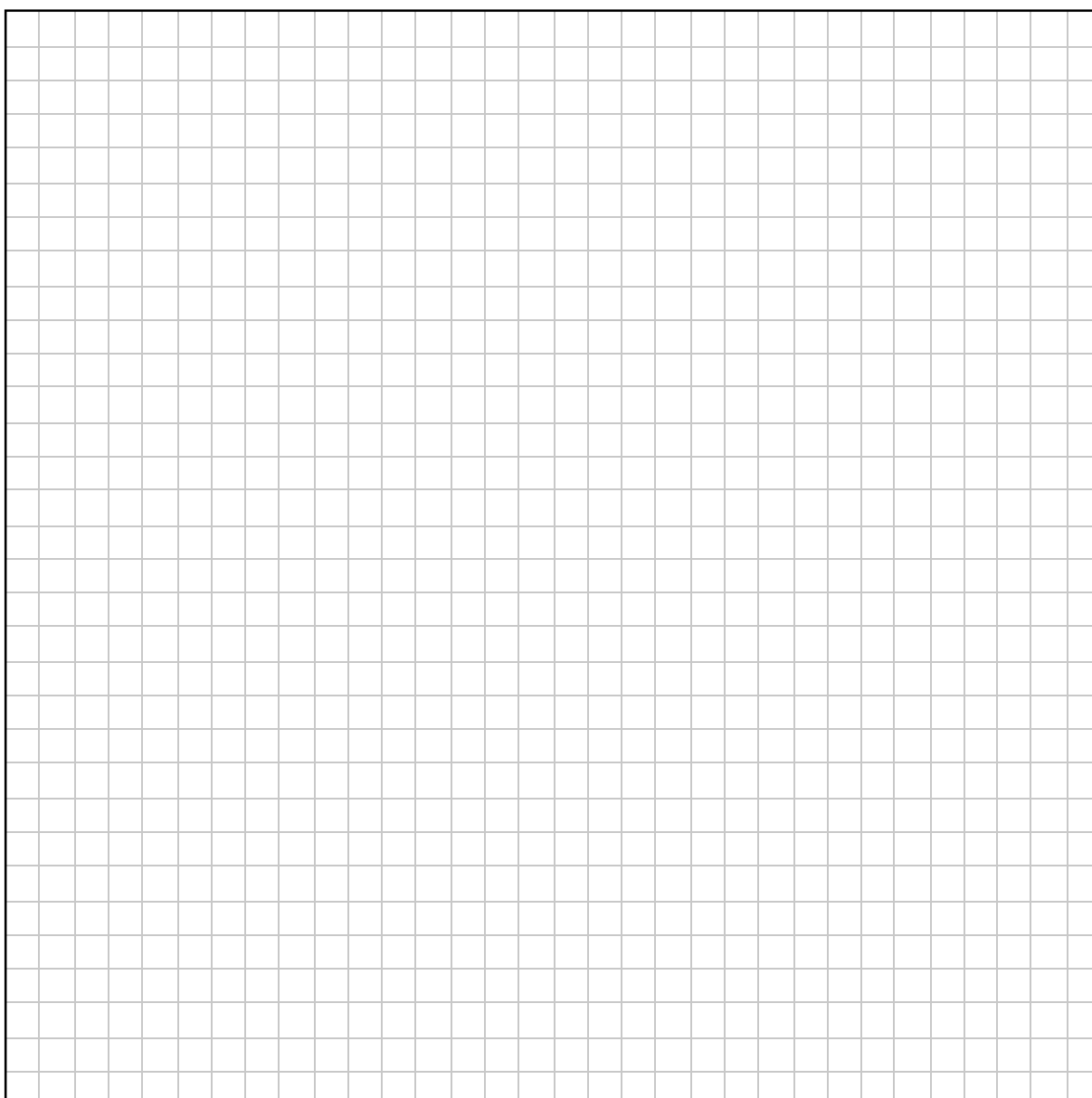




- (c) Another organisation published a report in 2021 which highlighted trends amongst children and young people during the academic year 2020/2021. They collected data on the most popular apps amongst survey respondents. The table below shows the percentage of respondents who used each app listed.

	YouTube	TikTok	Snapchat
Viewing videos	74%	47%	37%
Posting videos	16%	80%	30%

Draw a graph (or graphs) to help compare the results for the various apps. Show any relevant working out. Label your graph(s) clearly.



*This question continues on the next page*

- (d) The table below gives information gathered by a school about the amount of time 8 – 12 year olds are allowed to spend online.
- (i) Complete the table by filling in the missing percentages.

Time allowed online	Percentage in 2019	Percentage in 2022
Never allowed	14	3
Rarely allowed	24	
At weekends for an agreed amount of time		20
At weekends for as long as I want	12	28
I can go online whenever I want	24	42
<b>Total</b>	<b>100</b>	<b>100</b>

- (ii) Sorcha says ‘Children are allowed to spend more time online in 2022 than they were in 2019’. Do you agree or disagree with Sorcha?

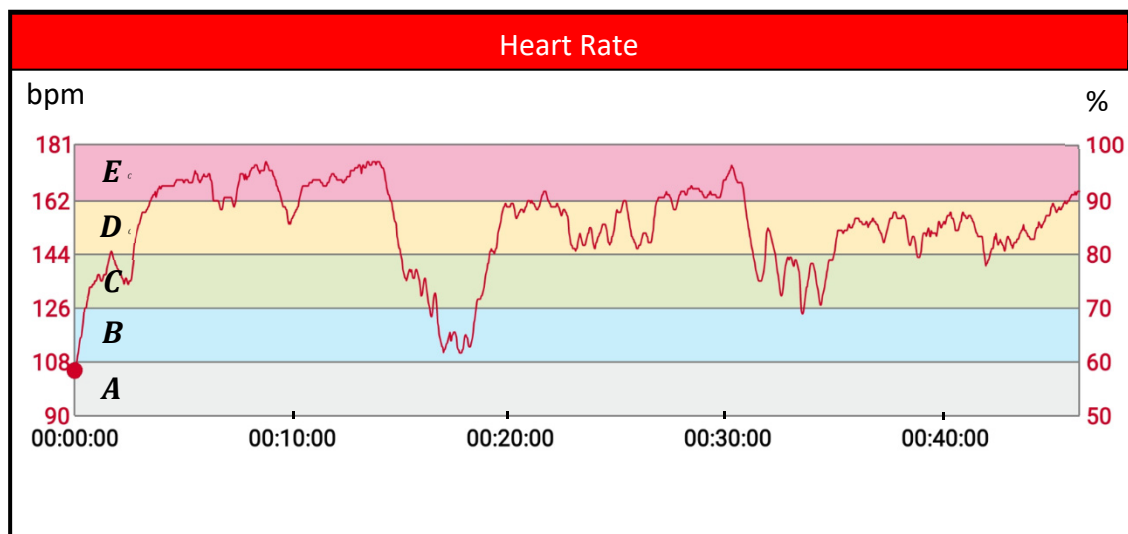
(Tick (✓) **one** box only)      Agree       Disagree

Give **one** reason for your answer.  
**Use data from the table above to support your argument.**

Reason: \_\_\_\_\_



During each class Jamie wears a monitor that tracks his heart rate in beats per minute (bpm). The results for one class are shown on the graph below.



(c) At the beginning of the class Jamie’s heart rate was 105 beats per minute (bpm).

(i) Use the graph above to find an **estimate** for his **maximum heart rate** during the class.


(ii) Tick the correct box to describe which **Zone** Jamie’s heart rate was in **after 24 minutes**.

Grey Zone A	Blue Zone B	Green Zone C	Yellow Zone D	Pink Zone E
90 – 108 bpm	109 – 126 bpm	127 – 144 bpm	145 – 162 bpm	163 – 181 bpm
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



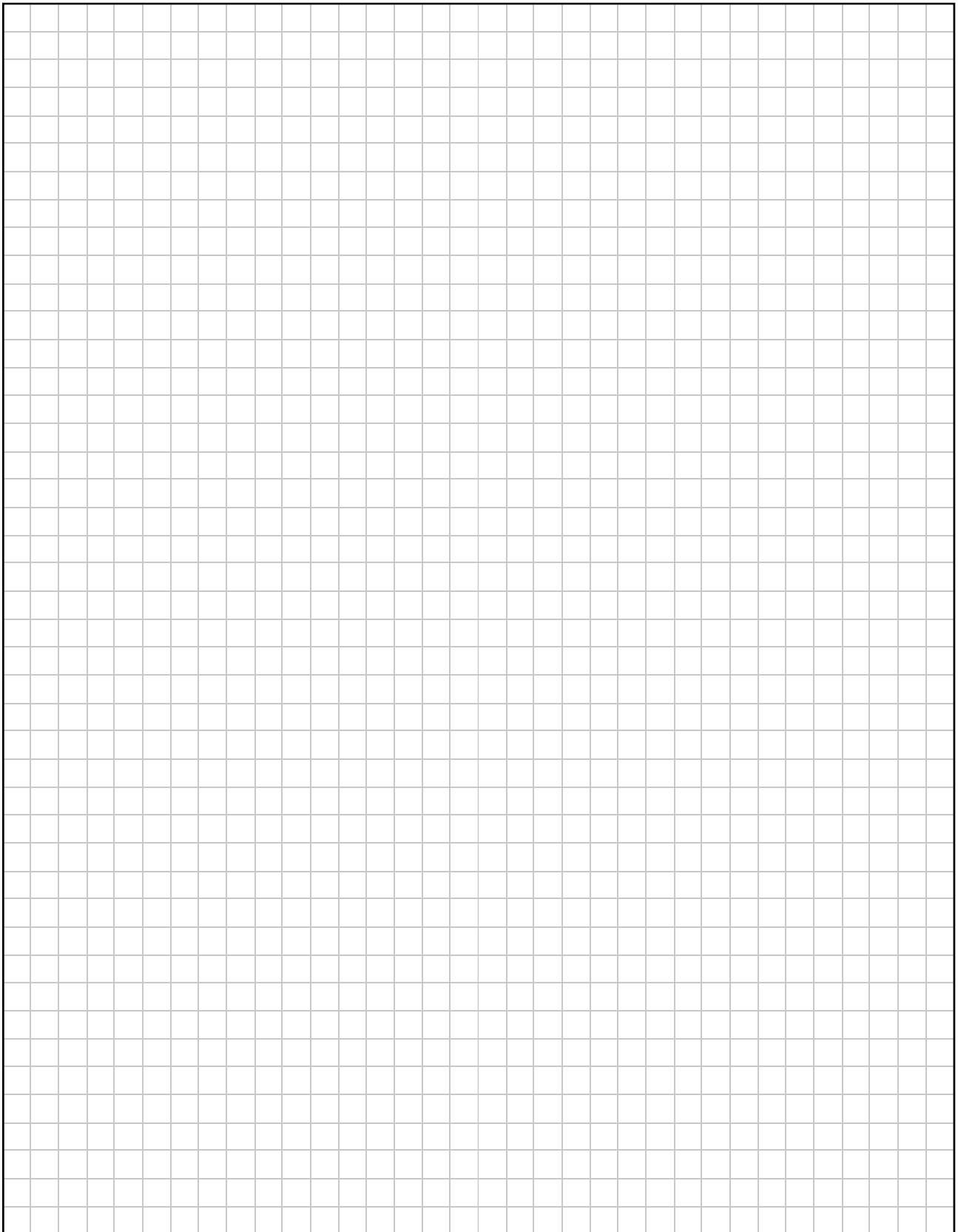






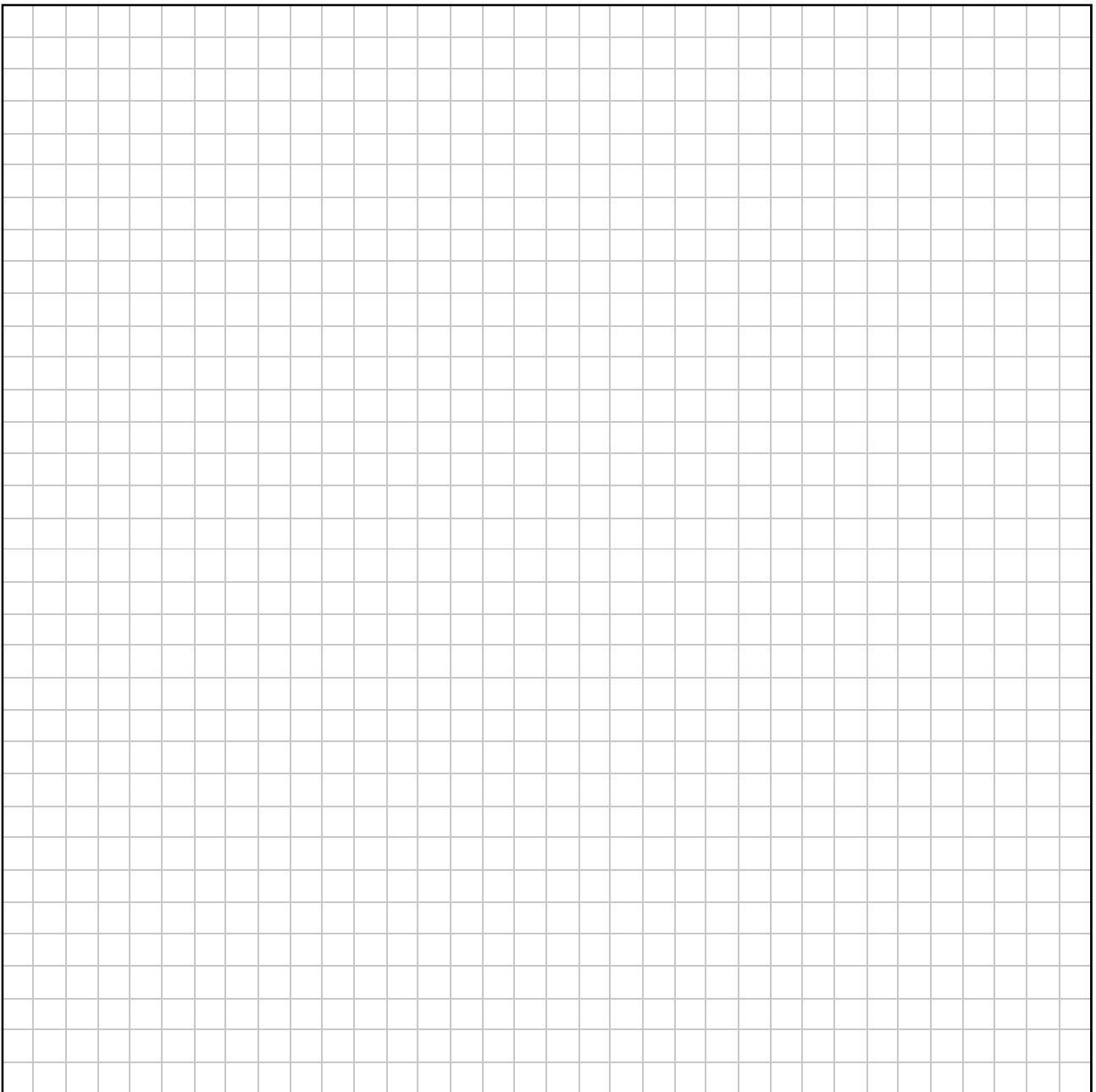

Page for extra work.

Label any extra work clearly with the question number and part.



Page for extra work.

Label any extra work clearly with the question number and part.



### Acknowledgments

Image on page 2: [www.ameliaphillips.com](http://www.ameliaphillips.com). Altered.

Image on page 3: [www.tesco.com](http://www.tesco.com). Altered.

Image on page 4: [www.bunnylady.com](http://www.bunnylady.com). Altered.

Source on page 10: [www.cybersafekids.ie](http://www.cybersafekids.ie).

Image on page 14: [www.polar.com](http://www.polar.com). Altered

Do not write on this page

**Copyright notice**

This examination paper may contain texts or images for which the State Examinations Commission is not the copyright holder. It has been prepared in accordance with Section 53(5) of the Copyright and Related Rights Act, (2000). Any subsequent use for a purpose other than the intended purpose is not authorised. The Commission does not accept liability for any infringement of third-party rights arising from unauthorised distribution or use of this examination paper. Material may have been adapted, for the purpose of assessment, without the authors' prior consent.

Leaving Certificate Applied – Common Level

## Mathematical Applications

Friday 9 June

Morning 9:30 to 11:30