Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2014

Mathematics
(Project Maths – Phase 3)

Paper 2

Foundation Level

Monday 9 June   Morning 9:30 – 12:00

300 marks

Examination number

Centre stamp

Running total	

For examiner	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

Grade

Instructions

There are **two** sections in this examination paper.

Section A	Concepts and Skills	200 marks	8 questions
Section B	Contexts and Applications	100 marks	2 questions

Answer all ten questions, as follows:

In Section A, answer

Questions 1 to 7 and

either Question 8A **or** Question 8B.

In Section B, answer Question 9 and Question10.

Write your answers in the spaces provided in this booklet. You may lose marks if you do not do so. There is space for extra work at the back of the booklet. You may also ask the superintendent for more paper. Label any extra work clearly with the question number and part.

The superintendent will give you a copy of the *Formulae and Tables* booklet. You must return it at the end of the examination. You are not allowed to bring your own copy into the examination.

You will lose marks if all necessary work is not clearly shown.

Answers should include the appropriate units of measurement, where relevant.

Answers should be given in simplest form, where relevant.

Write the make and model of your calculator(s) here:

Section A	Concepts and Skills	200 marks

Answer **all eight** questions from this section.

Question 1 (25 marks)

**(a)** In an experiment, a number is chosen at random from the set of numbers

$$\{2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 28, 30\}.$$

Some possible outcomes are listed in the table below.
Find the probability of each outcome and write your answers in the table.

Outcome	Probability
The number is odd.	
The number is even.	
The number is 25.	
The number is less than 8.	

(b) Mary surveyed 150 students to find which social networking sites they use. Some of the results are shown in the Venn diagram below.

Snapchat   Twitter

[20]   [90]   [10]
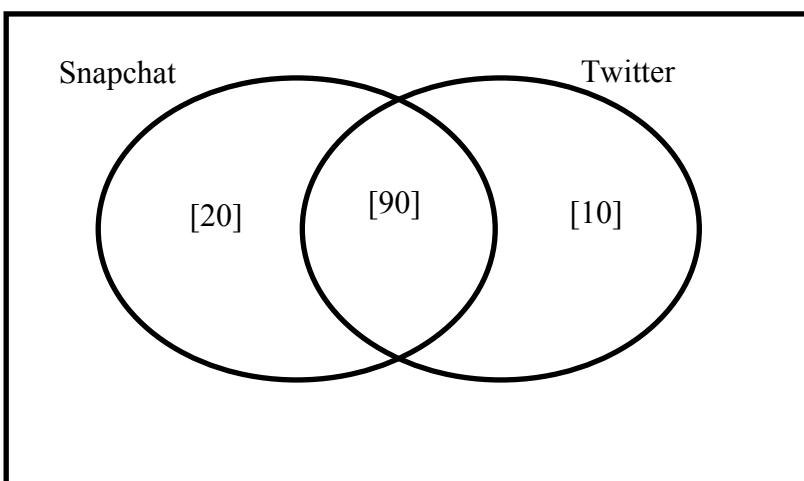
(i) Find the number of students who used neither of the two sites.

(ii) One student is chosen at random from those surveyed. Find the probability that the student used both sites.

Question 2 **(25 marks)**

(a) A fair spinner has four equal sectors, Red, Green, Yellow, and Blue.
The spinner is spun.

Red
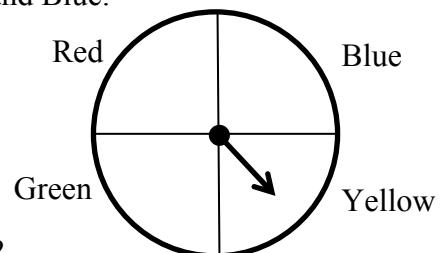
Blue

Green

Yellow

(i) What is the probability it stops on the yellow sector?

(ii) What is the probability it stops on the red or the green sector?

(iii) What is the probability it stops on any colour except blue?

(b) Joe plays a game with four coloured cards and a fair die. Each card is a different colour, as shown.

DIE

BLACK   WHITE   GREY   SILVER

Joe picks a card at random and rolls the die. The table below shows some of the possible outcomes.

(i) Complete the table below.

	1	2	3	4	5	6
Black	B, 1					
White					W, 5	
Grey		G, 2				
Silver						

Find the probability that Joe will get:

(ii) A black card and a 6

(iii) A white or a grey card, and a 5

(iv) A silver card and an even number.

Question 3 (25 marks)

The number of dinners sold in a school canteen over four weeks is shown in the table below.

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Week 1	42	52	12	38	45
Week 2	39	42	9	29	42
Week 3	52	37	11	50	48
Week 4	39	55	7	47	35

(a) Construct a stem-and-leaf plot of the data.

Key $5\,|\,2 = 52$

```
0 |
1 |
2 |
3 |
4 |
5 |
```
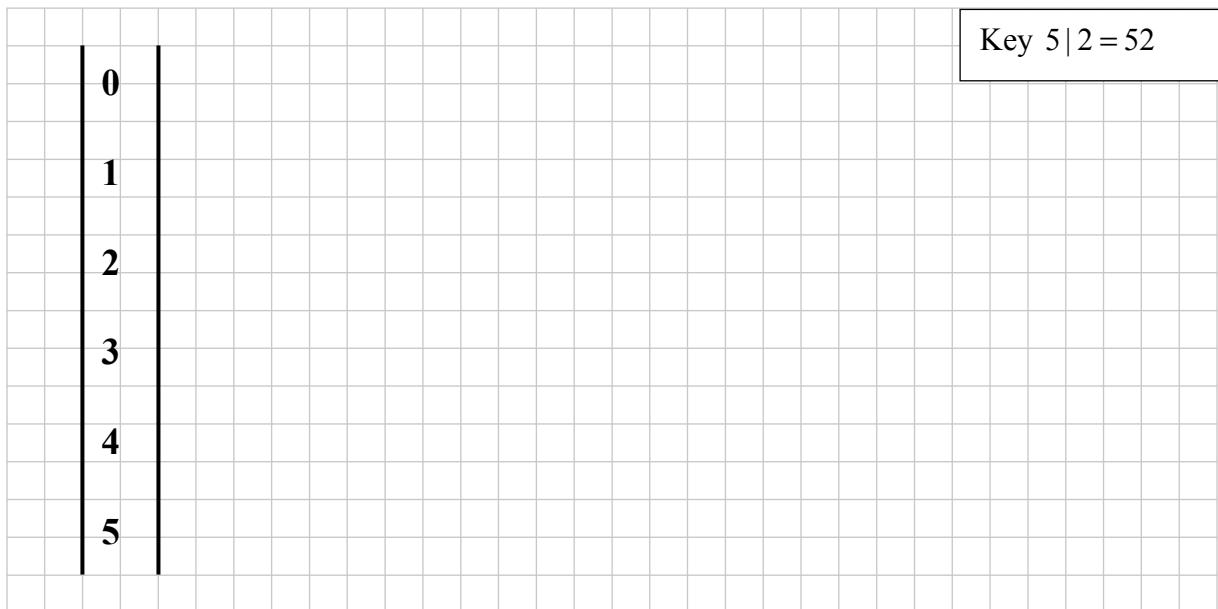
(b) Find the median and the mode of the data.

Median = _____   Mode = _____

(c) A school meal costs €2·50. Find the total cost of the meals in Week 1.

Question 4 **(25 marks)**

$P\ (3,\ -4)$ and $Q\ (-2,\ 0)$ are two points.

(a) Find the slope of the line PQ.

(b) Find the equation of the line PQ.
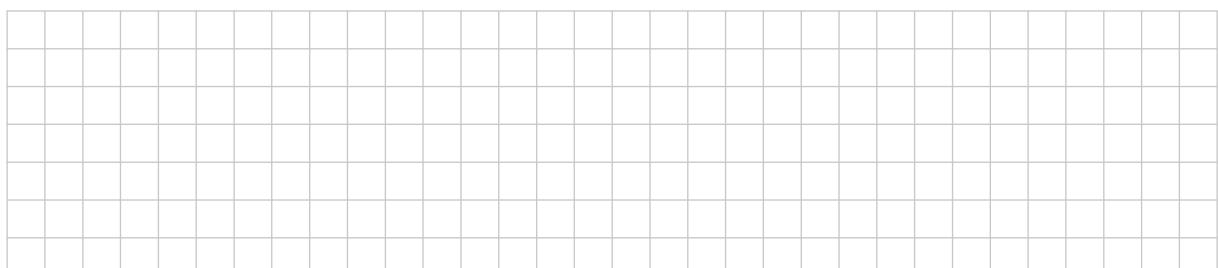
(c) A line l passes through the point $(7,\ 5)$ and is parallel to PQ. Find the equation of l.
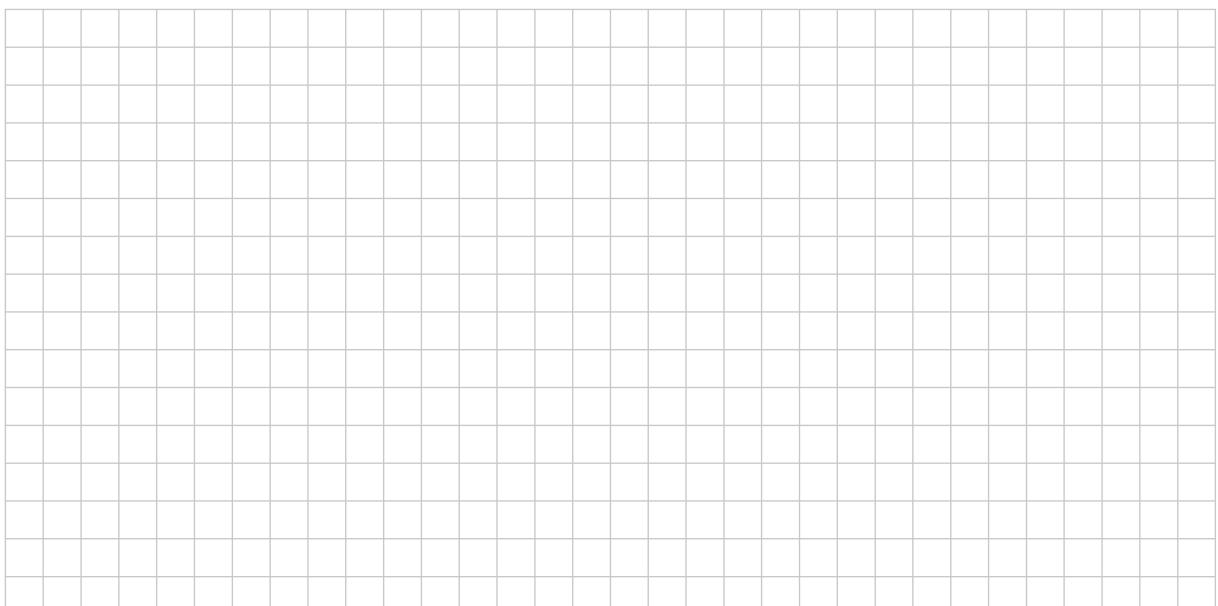
Question 5 (25 marks)

(a) Plot the points A (4, 6), B (1, 2) and C (7, 2) on the co-ordinate plane below. Label each point clearly.
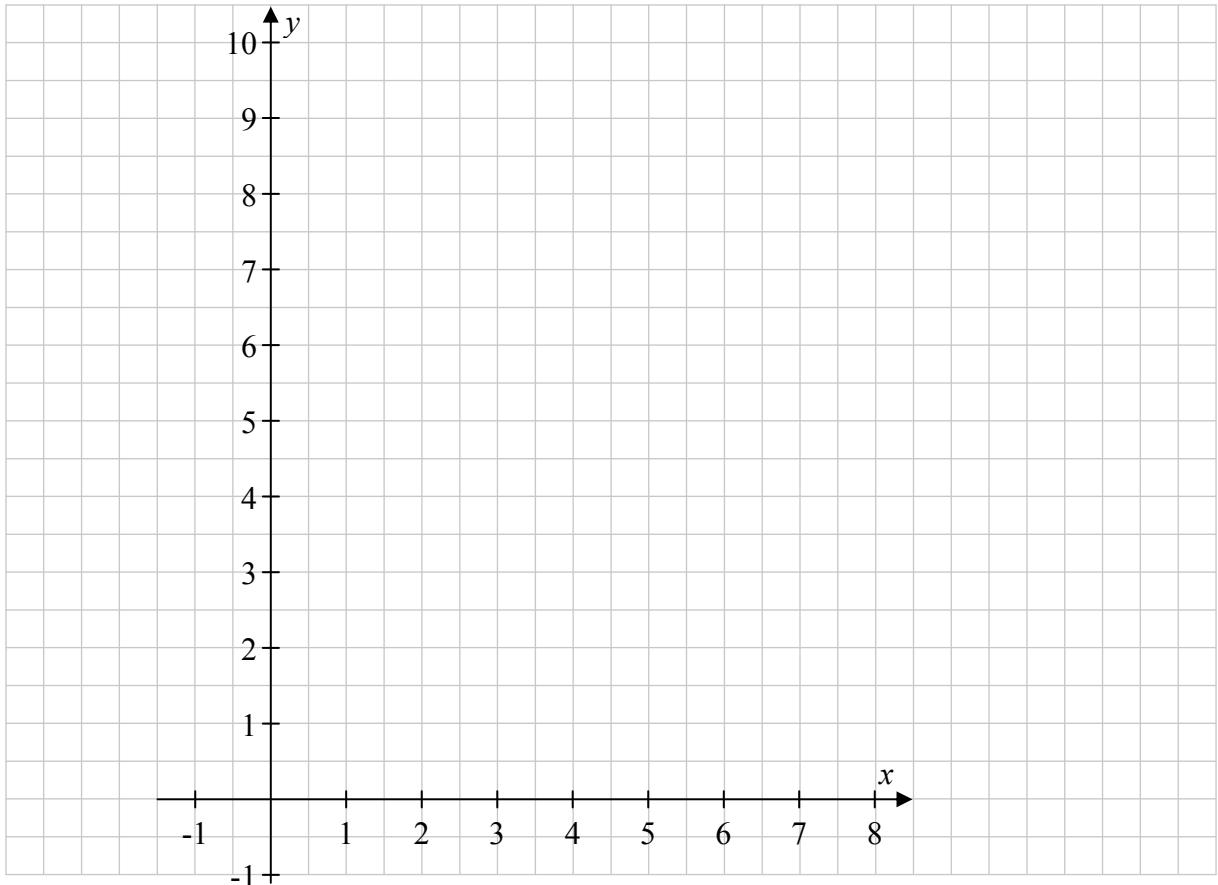

(b) Find the mid-point of [BC].
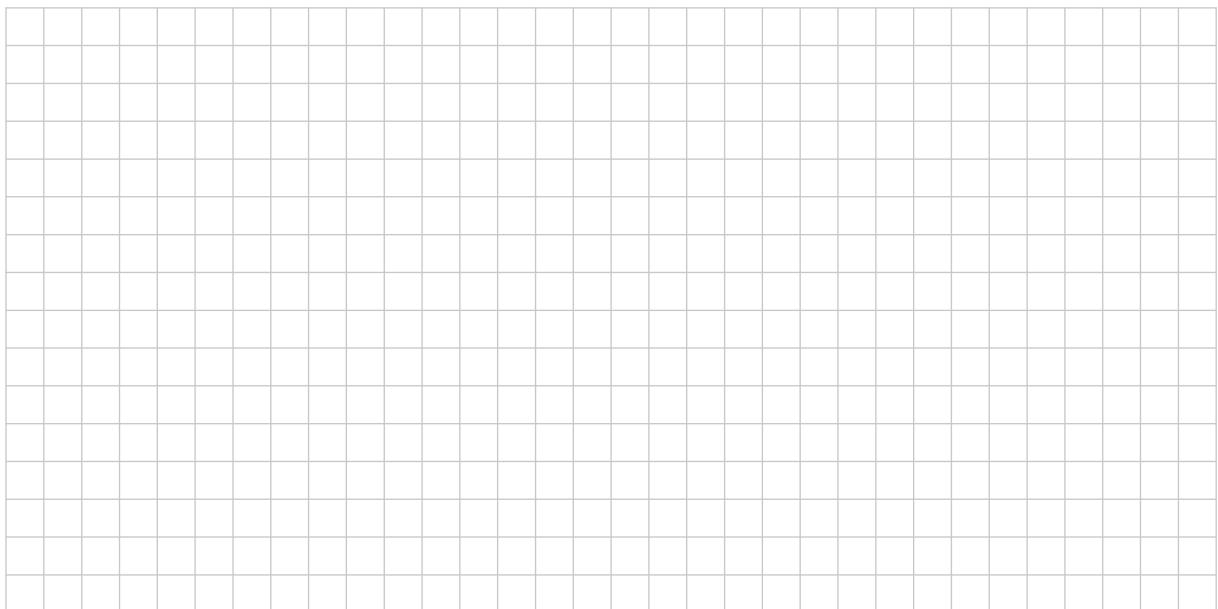
(c) **(i)** Find $|BC|$, the distance from B to C.

Answer: _____

(ii) Use the distance formula to find $|AB|$.

Question 6 **(25 marks)**

Jack recorded the different things he did during a 24 hour period. He displayed the information in the following pie chart.
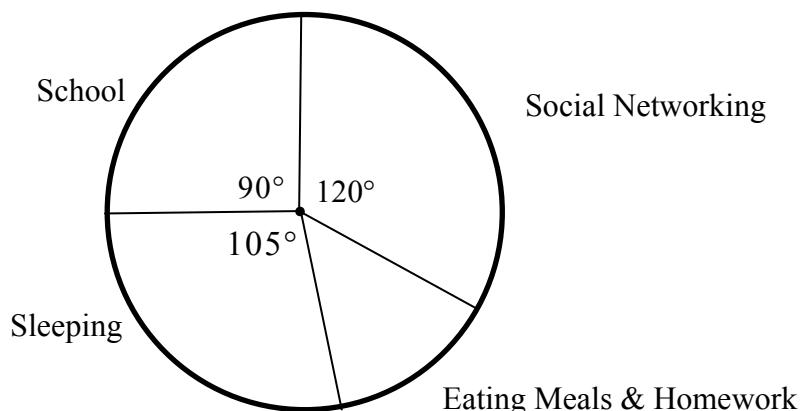
(a) Which activity did Jack spend the most time on?

(b) Find the size of the angle for 'Eating Meals & Homework'.

(c) How long did Jack spend eating meals and doing his homework?

(d) 40% of the time he spent eating meals and doing his homework was spent eating. Find how long he spent at his homework.

Question 7 **(25 marks)**

David is speaking at a conference. He wishes to project
images from his laptop onto a large screen. The dimensions
of his laptop screen are 34·5 cm by 19·3 cm.
The enlargement of David's images will fill the large screen
exactly. The scale factor of the enlargement is 5.

(a) Find the width of the large screen.

(b) Find the height of the large screen.

(c) Find the area of the large screen.

(d) Find the area of David's laptop screen.

(e) Find the ratio, area of the large screen : area of David's laptop screen.

page | running

Question 8 **(25 marks)**

Answer **either** 8A **or** 8B.

Question 8A

(a) In the diagram below, construct a tangent to the circle at the point *A*.
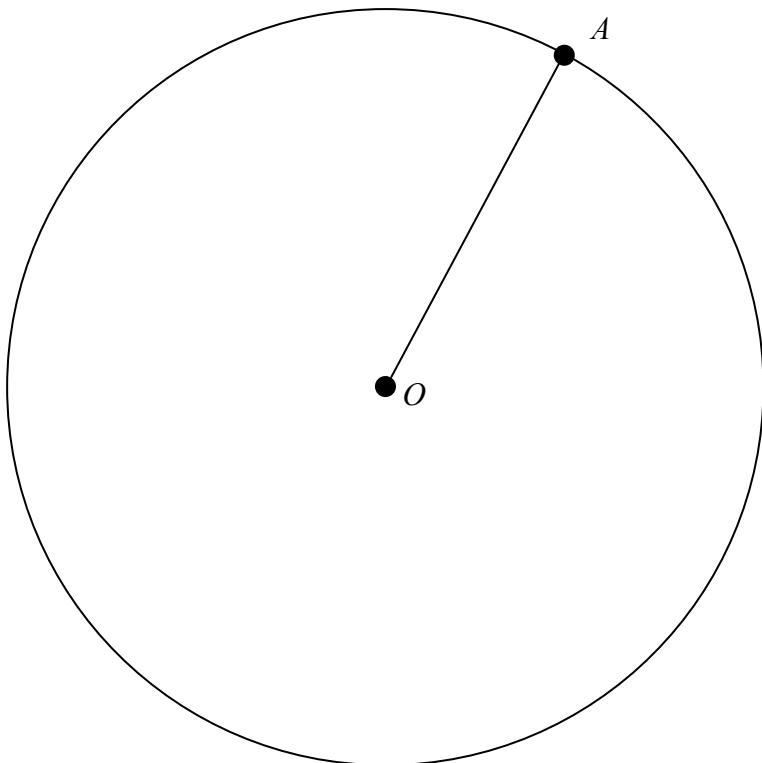
(b) The slope of the tangent at *A* is multiplied by the slope of the radius $[OA]$.
Write down the result.

(c) A second tangent is drawn to the circle at the point *D*. This line is parallel to the tangent at *A*.
Mark the point *D* on the circle.

OR

Question 8B

ABC is a right-angled triangle, with $|\angle BAC| = 90°$.
A circle of centre O passes through the points A, B and C, as shown.

$|AB| = 6$ cm and $|AC| = 8$ cm.
$[BC]$ is a diameter of the circle.
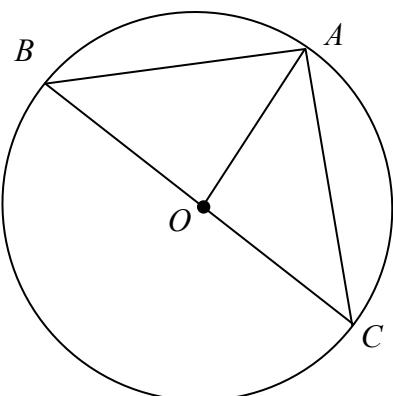
(a) Find $|BC|$.

(b) What is the length of $[OA]$?

(c) **(i)** Identify two isosceles triangles from the diagram.

(ii) Given that $|\angle AOC| = 106°$, to the nearest degree, find the following:

$|\angle AOB| = $ _____

$|\angle OBA| = $ _____.

page   running

Answer **both** Question 9 **and** Question 10 from this section.

Question 9   **(50 marks)**

(a) The mean monthly midday temperatures at Malin Head in 2013 are shown in the following table. The temperature is measured in degrees Celsius.

Table 1 (Mean temperature)												
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2013	7	8	9	7	10	12	13	16	13	8	7	8

(i) Which month had the highest mean temperature? _____

(ii) Find the difference between the highest mean temperature and the lowest mean temperature.

(iii) Find the mean annual midday temperature at Malin Head for 2013, correct to one decimal place.

(b) Rita owns a caravan park at Malin Head. She recorded the number of children who stayed in each caravan in her park on a Friday night in August 2013. The results are shown below.

3	2	0	4	2
5	3	4	1	7
3	5	2	5	1
6	4	7	6	1
3	5	7	1	2
0	4	2	3	5

(i) How many caravans did she survey?   Answer: _____

(ii) Complete the following table.

| Table 2								
Number of children per caravan	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Number of caravans								

(iii) How many children were in the park on that night?

**(iv)** Represent the data in Table 2 using a suitable chart.

page   running

Question 10 (50 marks)

Sean is installing a flight of stairs in a new house. The height from the floor to the top of the stairs is 2·5 m. The distance from the foot of the stairs to the wall is 3 m, as shown.
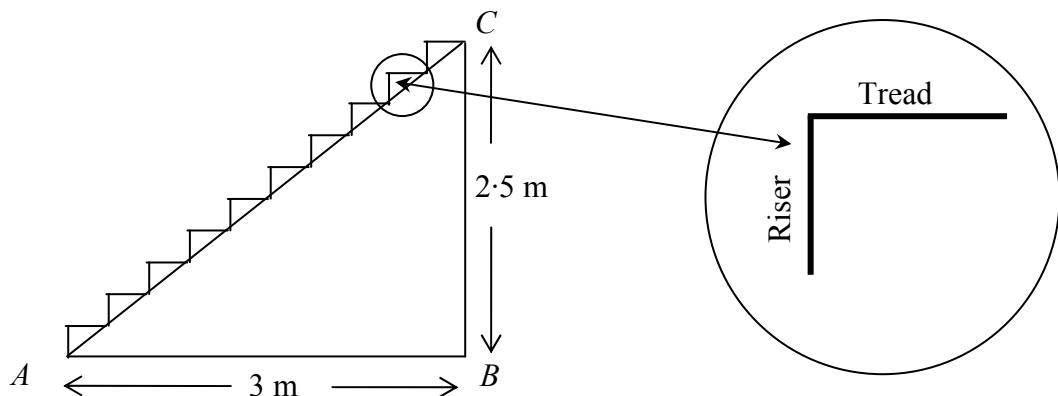
(a) **(i)** Find $|AC|$, the length of the stairs, correct to one decimal place.

(ii) There are 10 steps on the stairs. Find the height of each riser, in metres.

(iii) There are 10 steps on the stairs. Find the depth of each tread, in metres.

(iv) The stairs are 1 m wide. Find the total area of wood required to build the steps of the stairs.

(v) The wood to build the stairs costs €120 per square metre. Find the total cost of the wood needed to make the stairs.

(b) (i) Sean wants to make a storage area under the stairs. He closes the space under the stairs with a triangular sheet of plywood. Find the area of the triangle ABC.

**(ii)** Find $|\angle CAB|$, the angle between the floor and the stairs, correct to the nearest degree.

You may use this page for extra work.
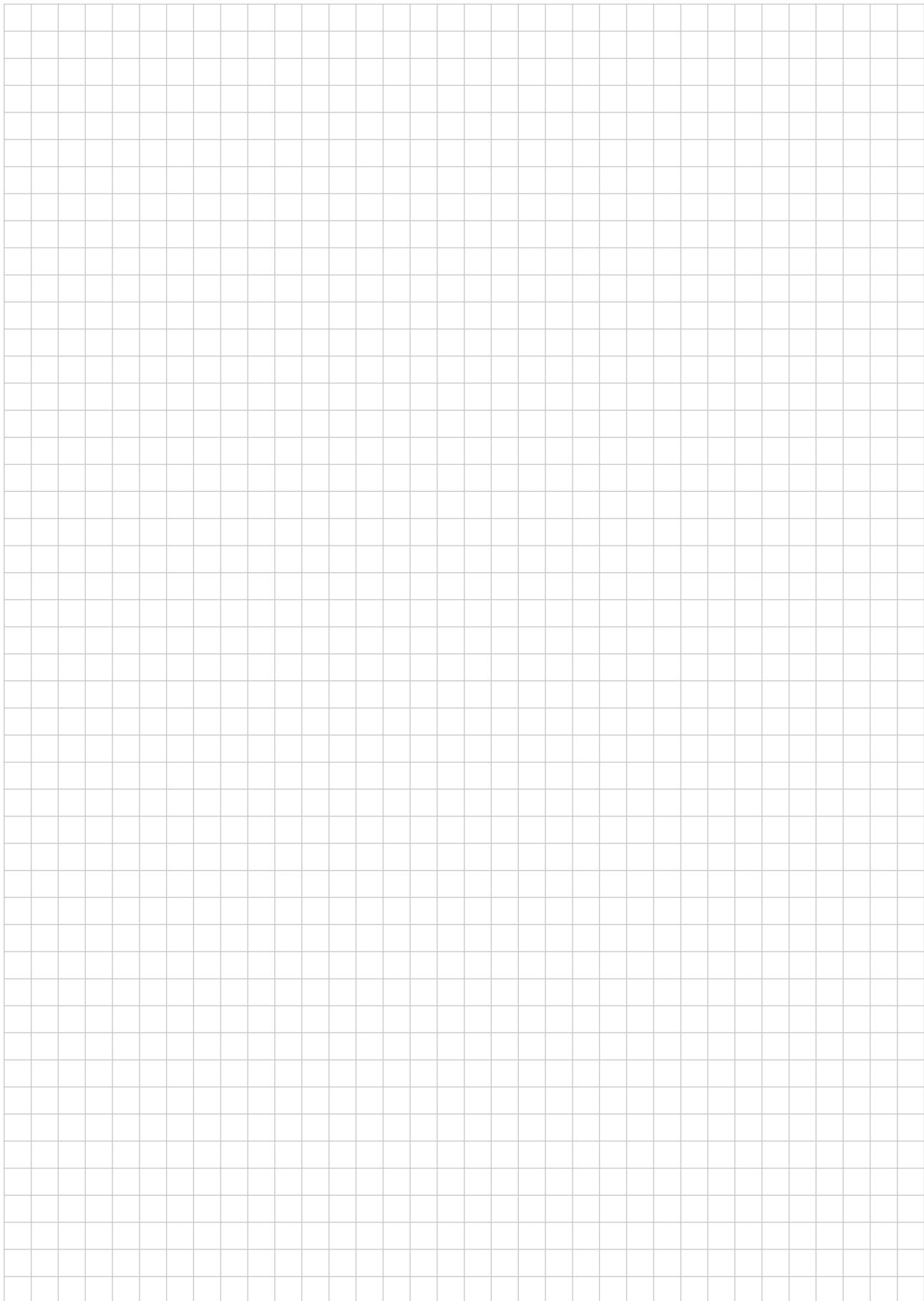
You may use this page for extra work.
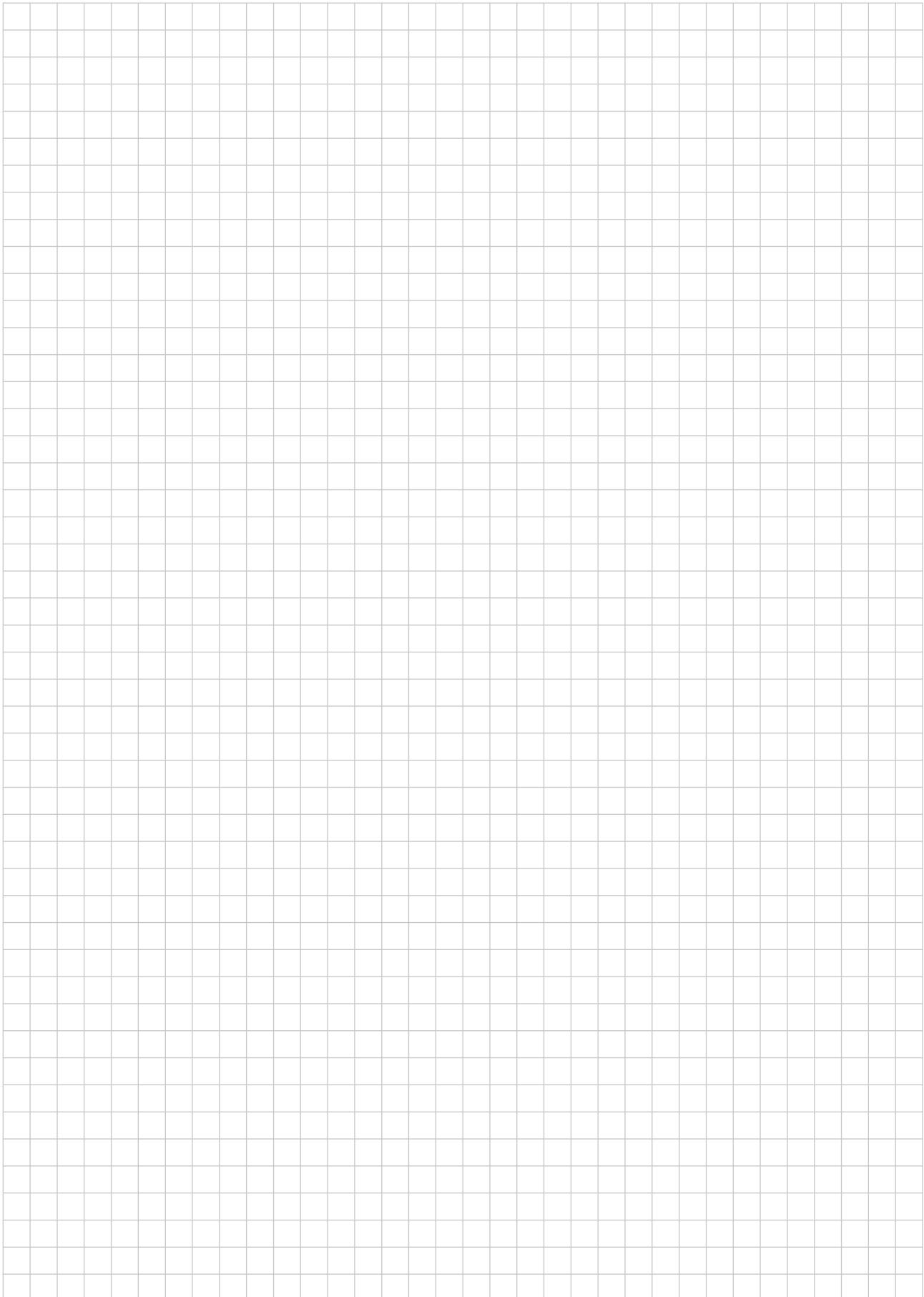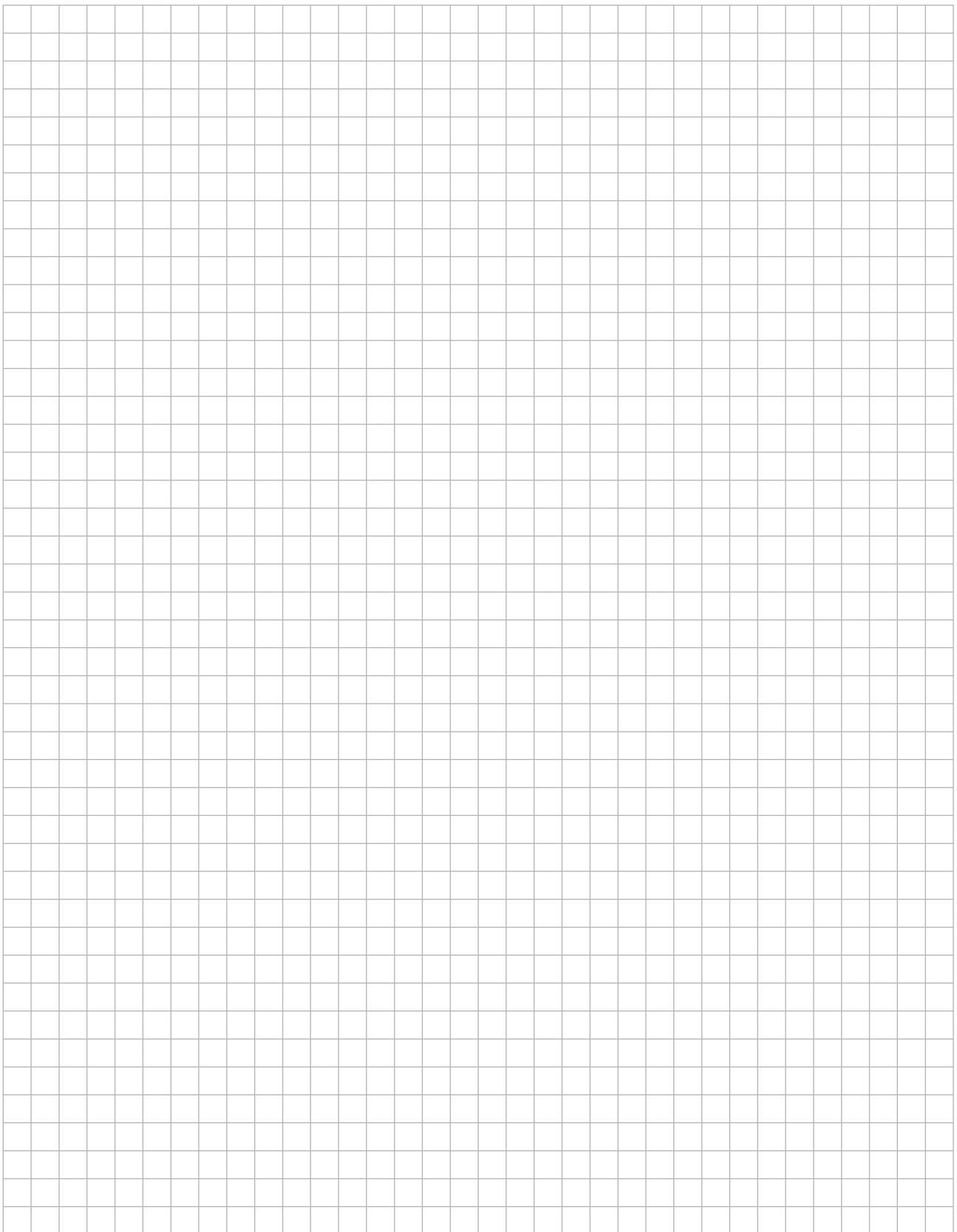
Leaving Certificate 2014 – Foundation Level

Mathematics (Project Maths – Phase 3) – Paper 2

Monday 9 June
Morning 9:30 – 12:00