



Coimisiún na Scrúduithe Stáit  
State Examinations Commission

Junior Certificate Examination, 2012

# Mathematics (Project Maths – Phase 2)

Paper 2

Ordinary Level

Monday 11 June – Morning 9:30 to 11:30  
300 marks

Examination number

Centre stamp

Running total

For examiner

Question	Mark	Question	Mark
1		11	
2		12	
3		13	
4		14	
5		15	
6			
7			
8			
9			
10		Total	

Grade

## Instructions

There are 15 questions on this examination paper. Answer **all** questions.

Questions do not necessarily carry equal marks. To help you manage your time during this examination, a maximum time for each question is suggested. If you remain within these times, you should have about 10 minutes left to review your work.

Write your answers in the spaces provided in this booklet. 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 booklet of *Formulae and Tables*. You must return it at the end of the examination. You are not allowed to bring your own copy into the examination.

Marks will be lost if all necessary work is not clearly shown.

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

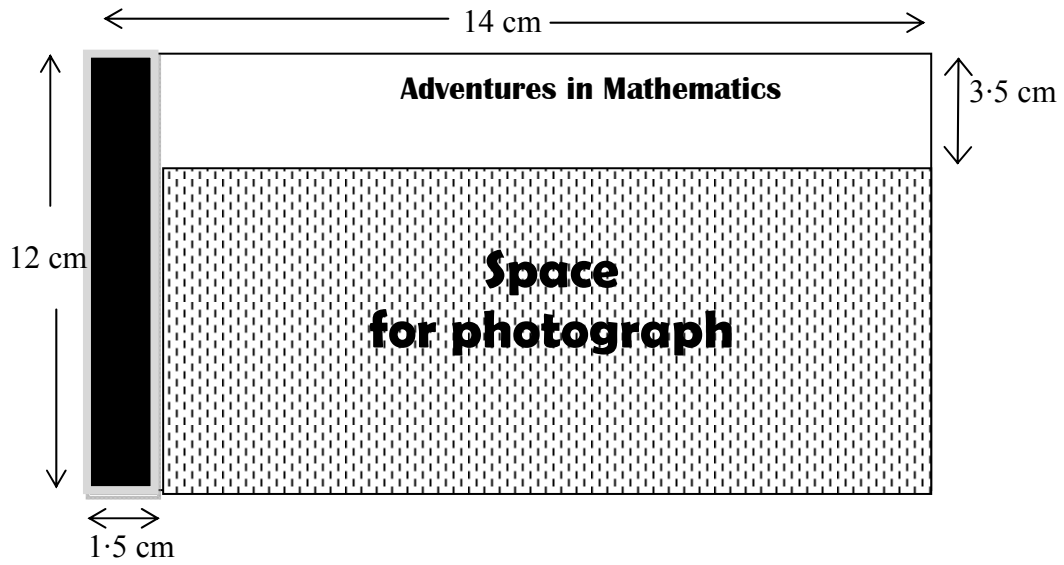
Answers should be given in simplest form, where relevant.

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

**Question 1**

**(suggested maximum time: 2 minutes)**

A designer is making a DVD cover as shown below (diagram not to scale). He has left a space for a photograph. Find the area of the space for the photograph.



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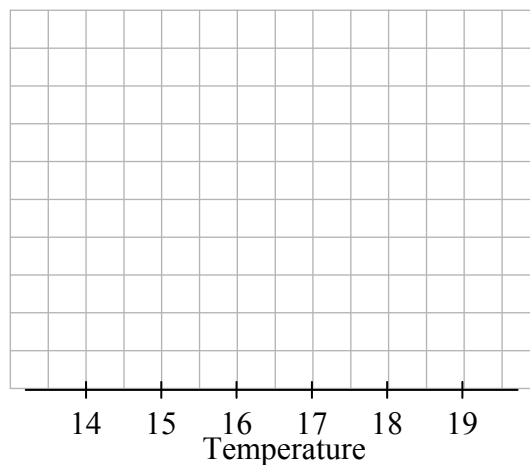


**Question 5****(suggested maximum time: 10 minutes)**

Karen went on holidays for two weeks in August 2011. Below is a record of the daily temperatures for the two weeks in August 2011.

Day	Temperature
Monday 15 <sup>th</sup>	17°
Tuesday 16 <sup>th</sup>	18°
Wednesday 17 <sup>th</sup>	16°
Thursday 18 <sup>th</sup>	17°
Friday 19 <sup>th</sup>	16°
Saturday 20 <sup>th</sup>	18°
Sunday 21 <sup>st</sup>	17°
Monday 22 <sup>nd</sup>	19°
Tuesday 23 <sup>rd</sup>	17°
Wednesday 24 <sup>th</sup>	15°
Thursday 25 <sup>th</sup>	15°
Friday 26 <sup>th</sup>	15°
Saturday 27 <sup>th</sup>	14°
Sunday 28 <sup>th</sup>	17°

- (a) What was the temperature on Thursday 18<sup>th</sup> of August? \_\_\_\_\_.
- (b) Use a line plot to show the number of times each temperature was recorded.



- (c) What is the range of the data? \_\_\_\_\_.

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- (f) Denis looked at the data and said “I can find out how many people in the survey normally listen to local radio”. Do you agree or disagree with Denis? Explain your answer.

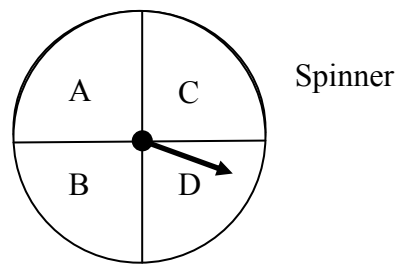
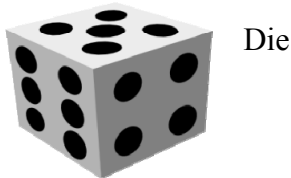
Answer: \_\_\_\_\_

Explanation: \_\_\_\_\_

**Question 8**

(suggested maximum time: 5 minutes)

Jack rolls a fair die and spins a fair spinner as shown.



- (a) Complete the table below showing all possible outcomes.

		Spinner			
		A	B	C	D
Die	1	(1,A)			
	2				
	3				
	4				
	5				
	6				(6,D)

- (b) How many possible outcomes are there?

\_\_\_\_\_

- (c) How many outcomes consist of an odd number and B?

\_\_\_\_\_

- (d) What is the probability that an outcome will contain an even number?

\_\_\_\_\_

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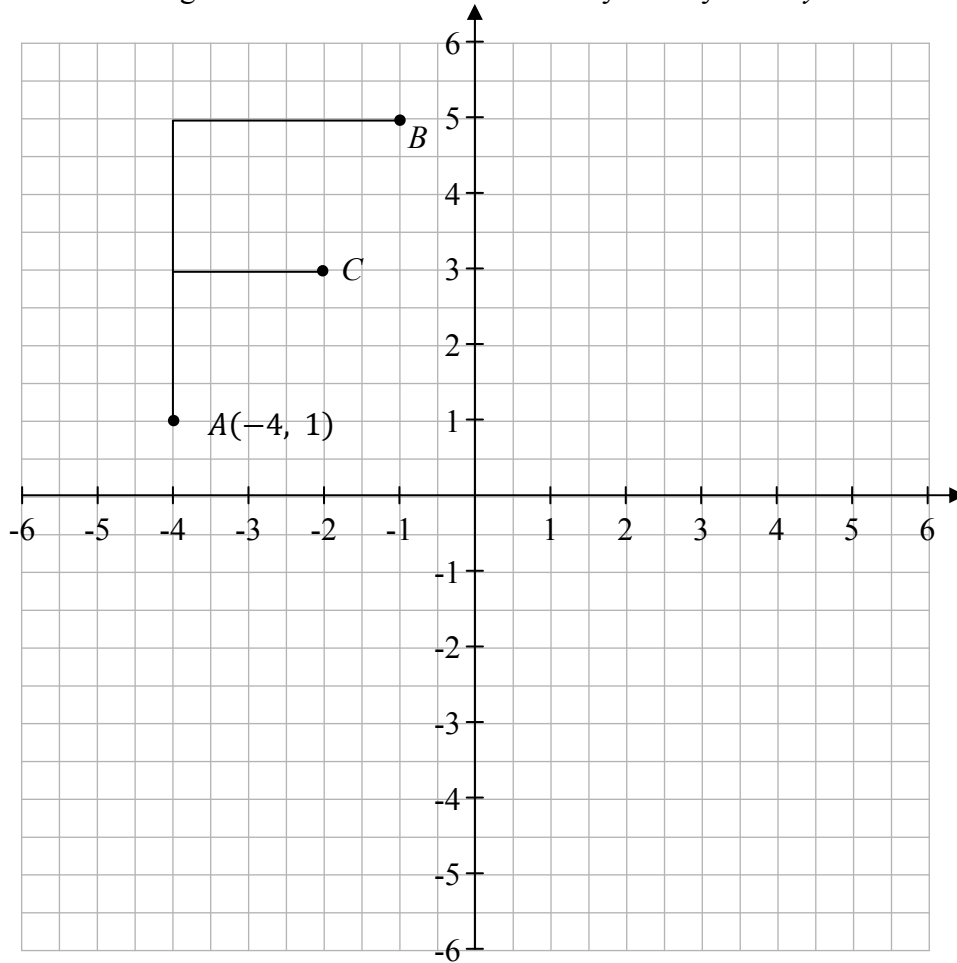


**Question 10**

**(suggested maximum time: 5 minutes)**

The diagram below shows the letter F on the co-ordinate plane.

- (a) Draw in the image of the letter F under an axial symmetry in the  $y$ -axis.



- (b) Write down the coordinates of the points  $B$  and  $C$ .

$B$  (      ,      )       $C$  (      ,      )

- (c)  $A$ ,  $B$  and  $C$  are mapped onto  $A'$ ,  $B'$  and  $C'$  under the transformation above. Write down the co-ordinates of  $A'$ ,  $B'$  and  $C'$ .

$A'$  (      ,      )       $B'$  (      ,      )       $C'$  (      ,      )

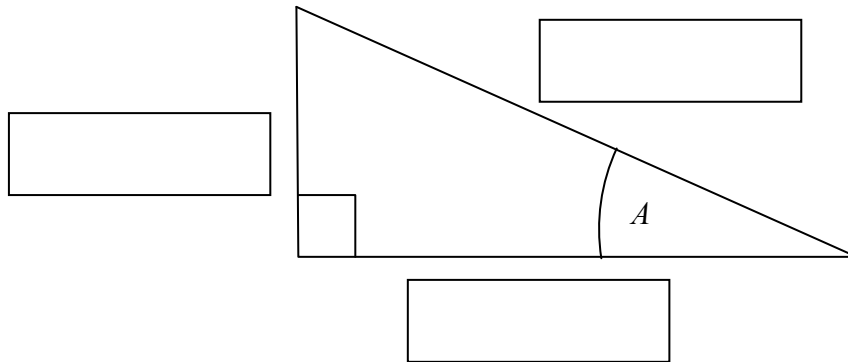
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**Question 12**

**(suggested maximum time: 5 minutes)**

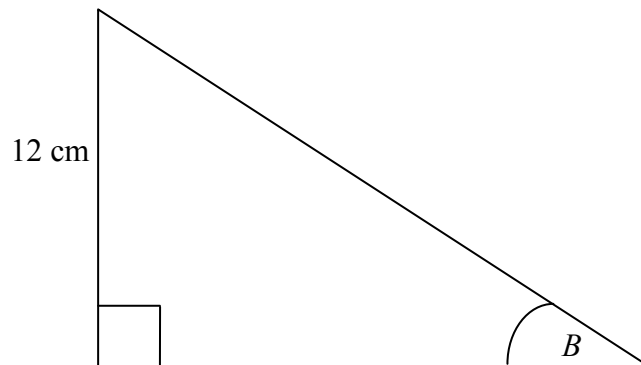
- (a) The diagram below shows the angle  $A$  in a right-angled triangle. Indicate which side is adjacent and which is opposite in relation to the angle  $A$ , and which side is the hypotenuse.



- (b) Fill in the appropriate ratios in the table below.

Trigonometric Ratio	Ratio
	$\frac{\textit{opposite}}{\textit{hypotenuse}}$
$\text{Cos } A$	
	$\frac{\textit{opposite}}{\textit{adjacent}}$

- (c) In the right angled triangle below  $B = 35^\circ$  and the opposite side is 12 cm. Find the length of the hypotenuse correct to the nearest centimetre.

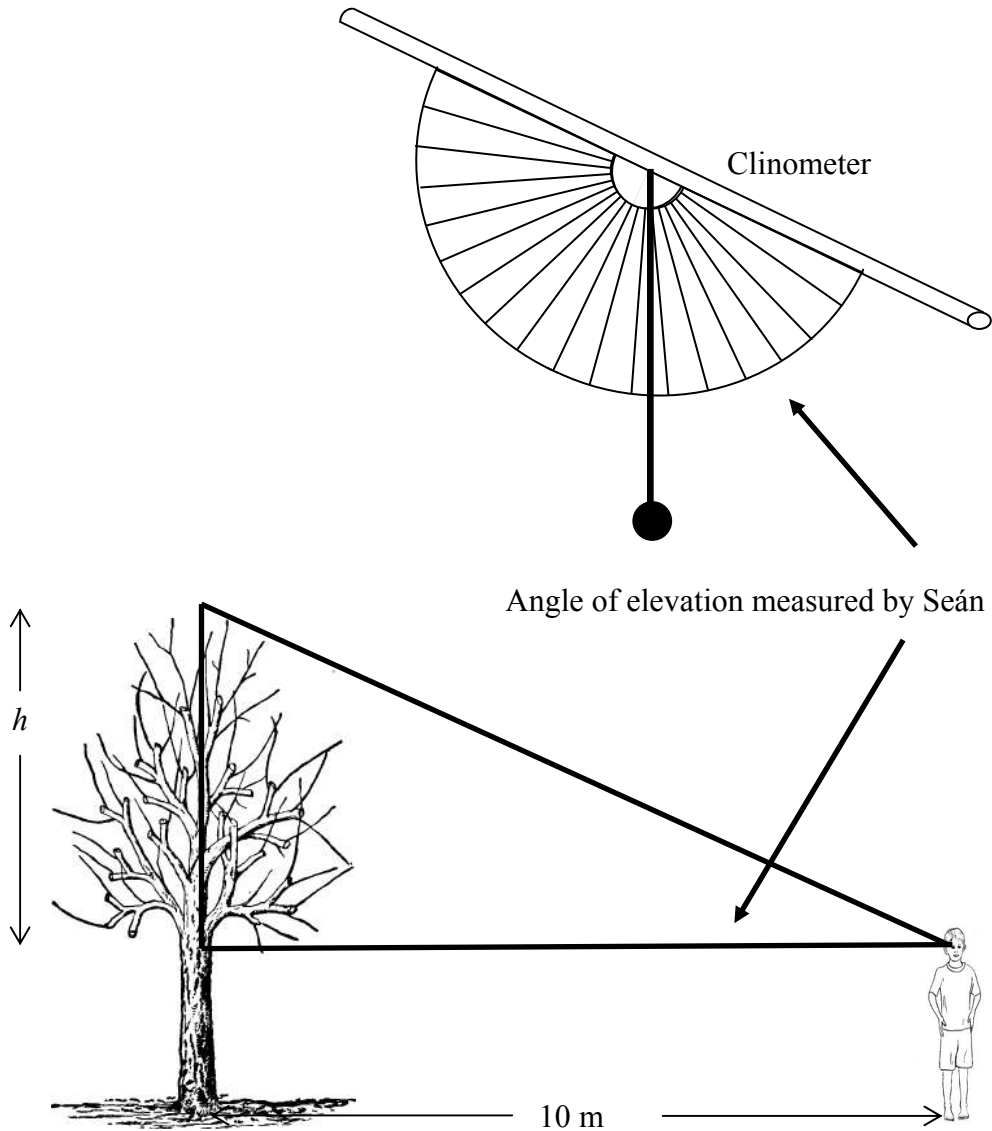


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**Question 13**

**(suggested maximum time: 10 minutes)**

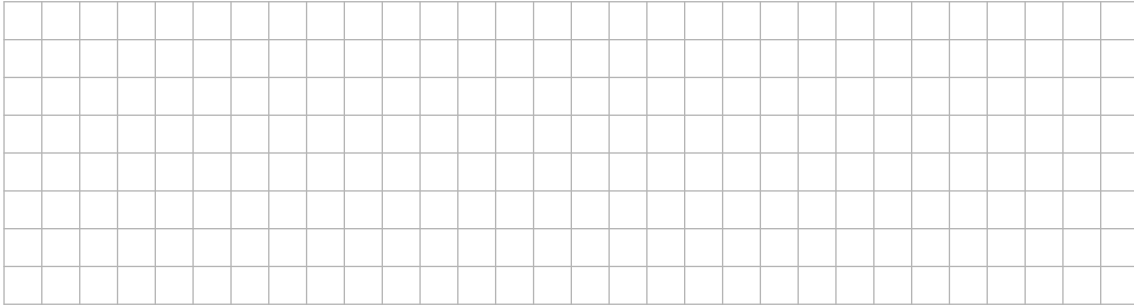
Seán makes a clinometer using a protractor, a straw, a piece of thread and a piece of plasticine (used as a weight). He stands 10 m from a tree and uses his clinometer to measure the angle of elevation to the top of the tree as shown. Seán is 1.75 m in height.



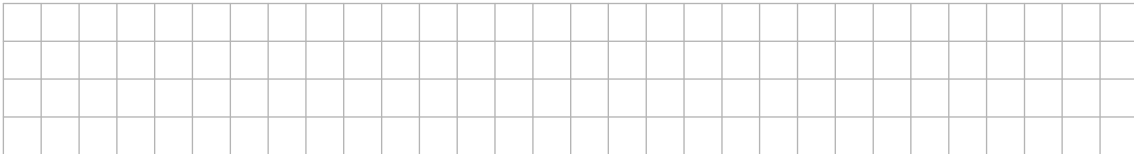
(a) Find the angle of elevation by reading the clinometer above. \_\_\_\_\_.



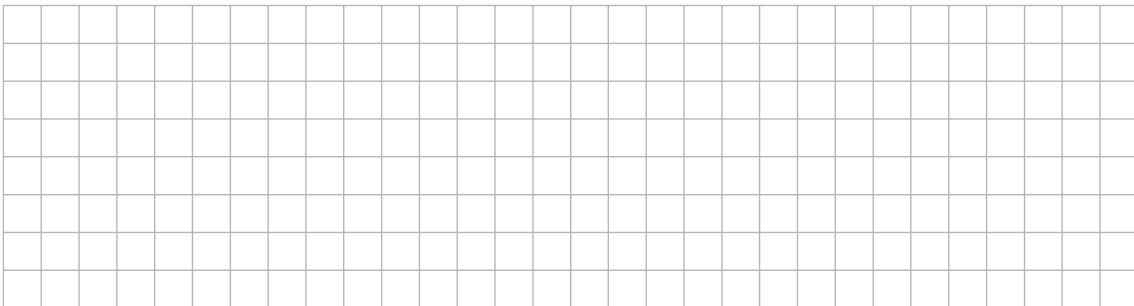
- (b) Calculate the height  $h$  as shown in the diagram. Give your answer correct to two decimal places.



- (c) Find the total height of the tree.



- (d) Another student uses the same method as Seán and finds the height of the tree to be 23.1 m. Seán did not get this answer. Give one possible reason why the answers might be different.



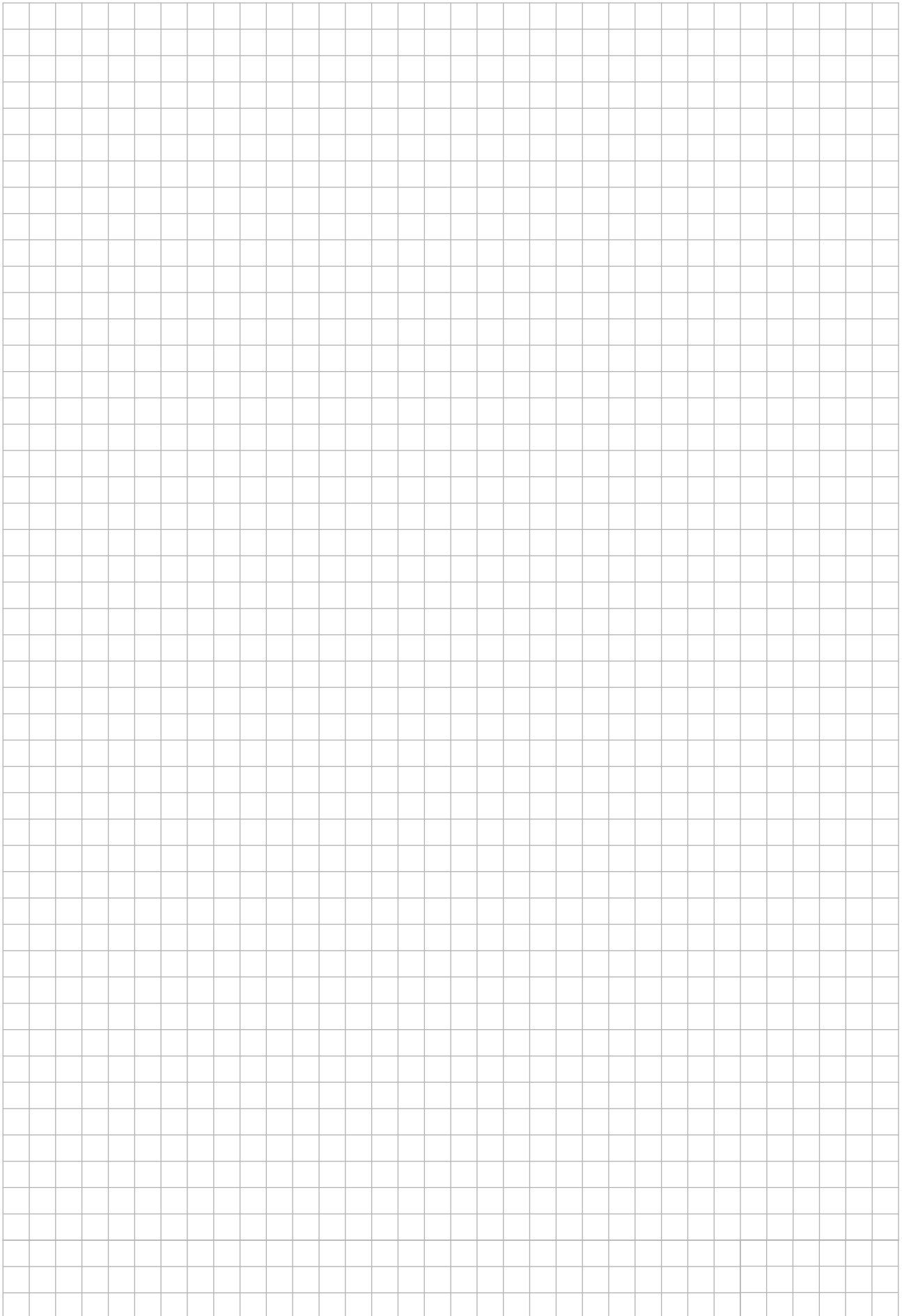




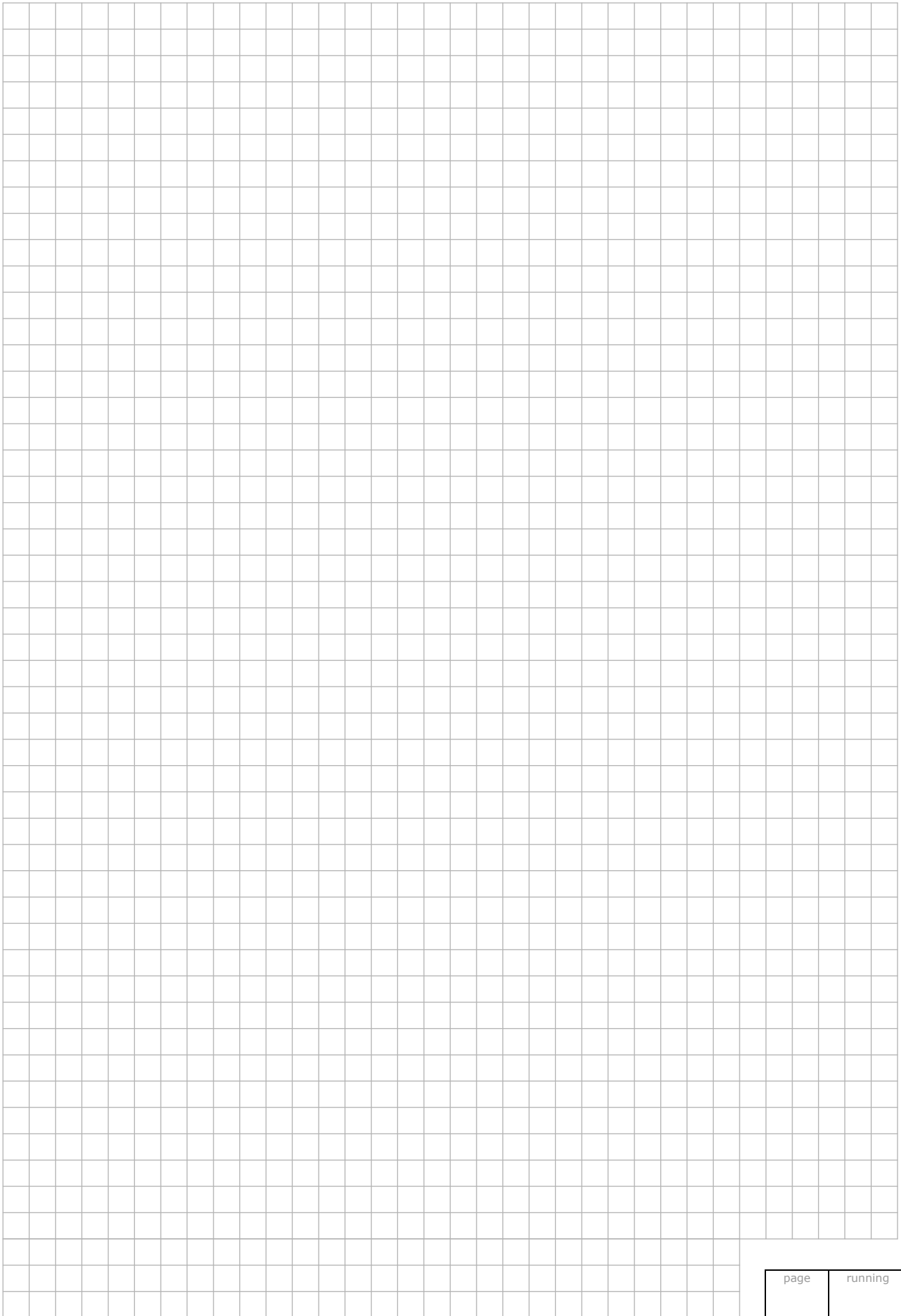




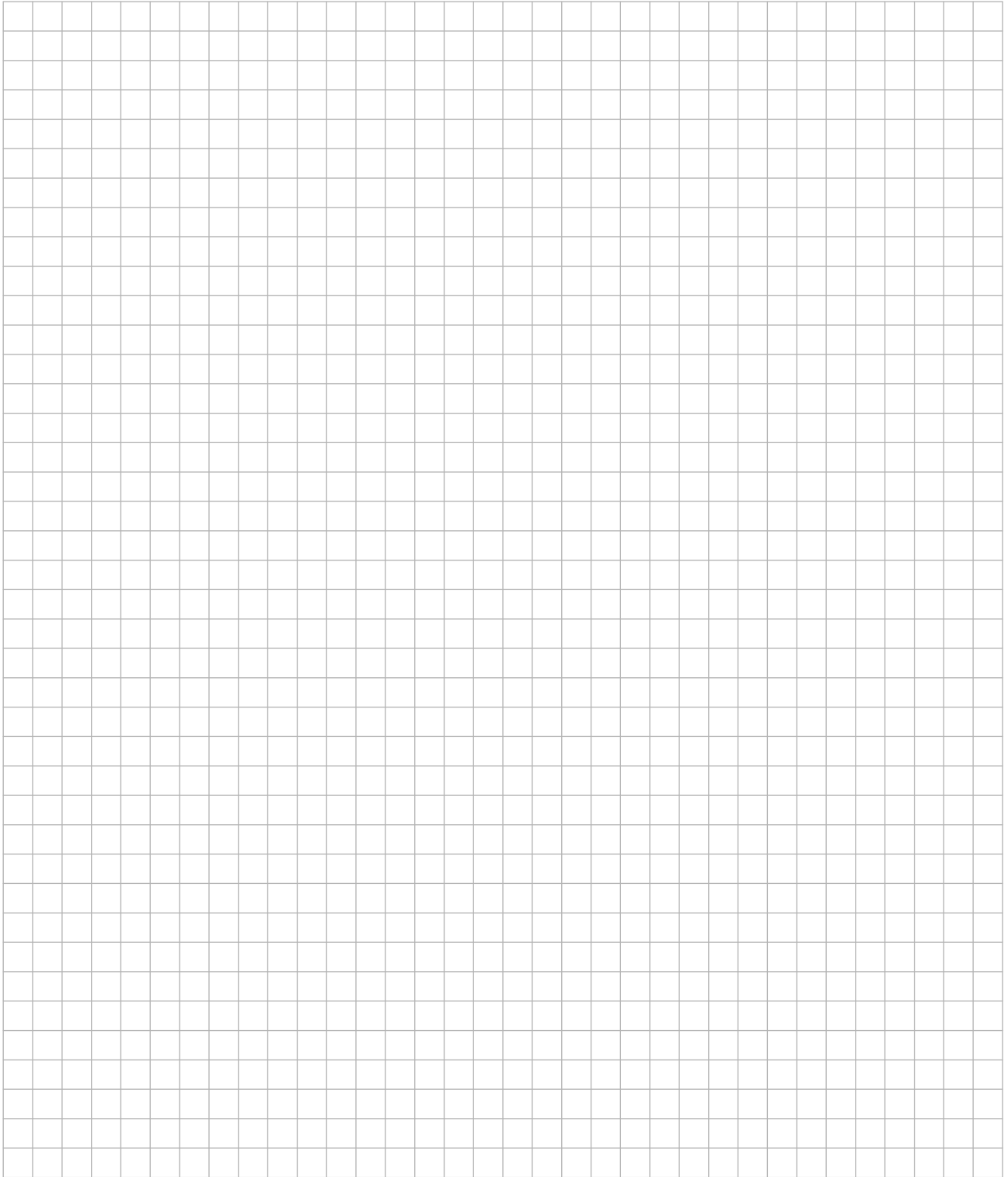
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