



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate Examination, 2012

Mathematics
(Project Maths – Phase 2)
Foundation Level

Friday 8 June Afternoon 2:00 to 4:00

300 marks

Examination number

Centre stamp

Running total	
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For examiner			
Question	Mark	Question	Mark
1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	
8		18	
9		19	
10		Total	

Grade

Instructions

There are 19 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.

Question 19 carries a total of 20 marks.

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: 5 minutes)

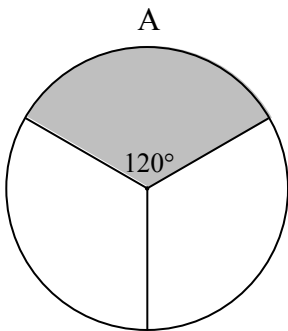
- (d) Which one of the numbers 7, 8 and 9 is a prime number? Give a reason for your answer.

Answer:	
Reason:	

Question 2

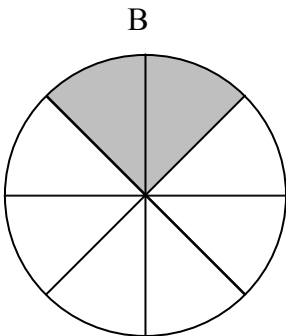
(suggested maximum time: 2 minutes)

- (a)** What fraction of circle A is shaded?



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- (b)** What fraction of circle B is shaded? Give your answer in its simplest form.



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Question 3 (suggested maximum time: 5 minutes)

Question 3 (suggested maximum time: 5 minutes)

- (a)** A computer costs €500 plus VAT. If the VAT rate is 23%, find the total cost of the computer.



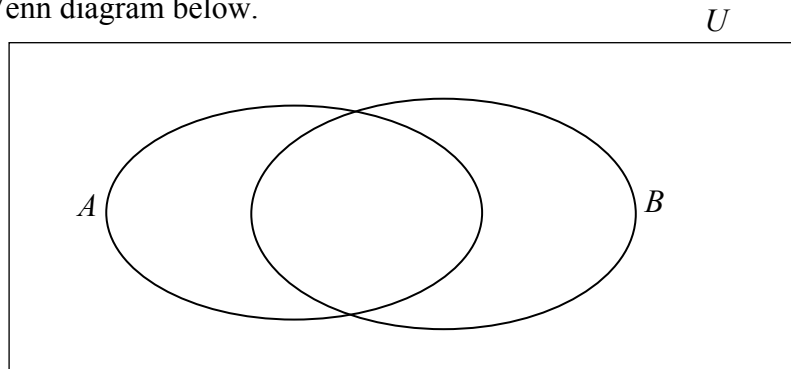
- (b)** Alex is going to England. He has €250 and he wants to change it to sterling (£). The rate is €1 = £0.86. How much sterling will he get?

Question 4 (suggested maximum time: 5 minutes)

Question 4 (suggested maximum time: 5 minutes)

$$U = \{1, 2, 3, 4, 5, 6, 7\}, A = \{3, 4, 6, 7\}, B = \{1, 6\}.$$

- (a)** Fill in the Venn diagram below.

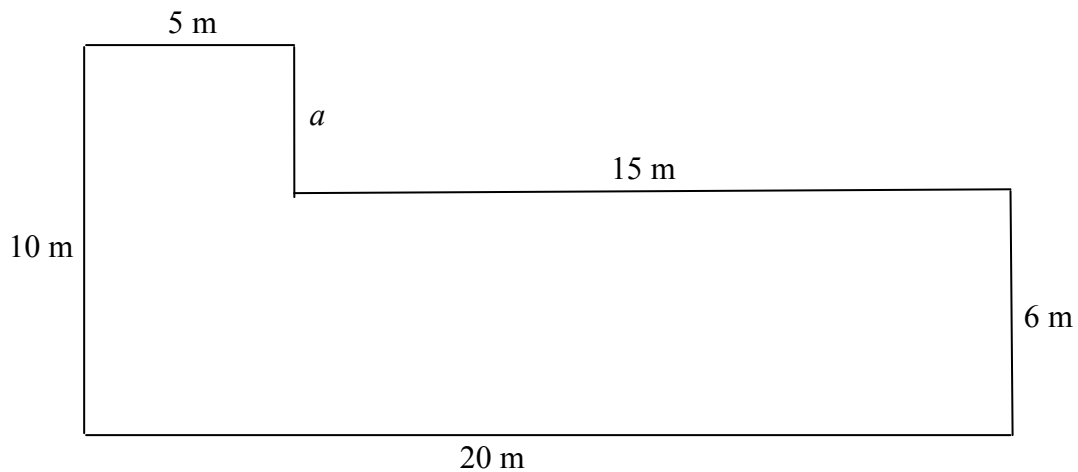


- (b) List the elements of $A \cup B$.

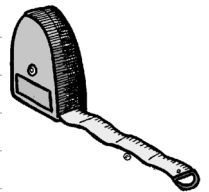
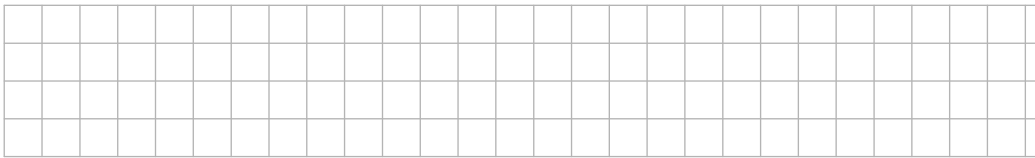
$$A \cup B = \{ \quad , \quad , \quad , \quad , \quad \}$$

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

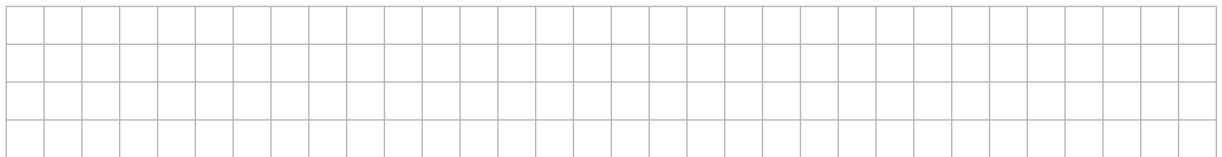
A farmyard, with its measurements, is shown in the diagram.



- (a) Find a , the missing distance.

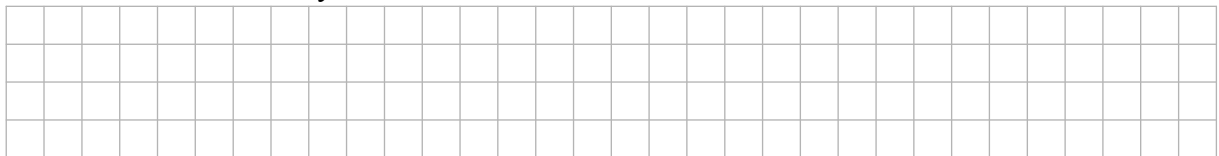


- (b) Find the perimeter of the farmyard.



- (c) On the diagram, draw a line that divides the farmyard into two rectangles.

- (d) Find the area of the farmyard in m^2 .



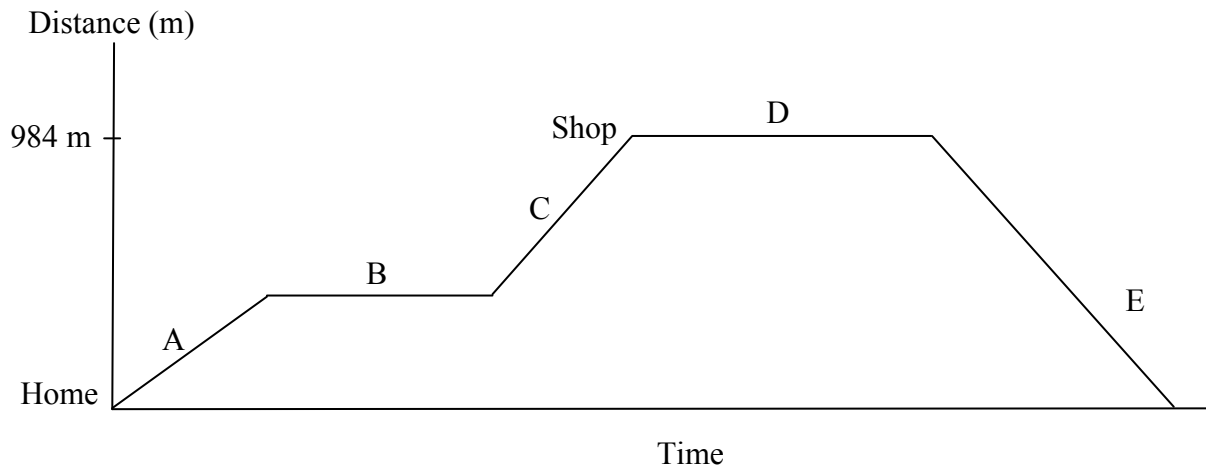
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Question 6 (suggested maximum time: 10 minutes)

Question 6 (suggested maximum time: 10 minutes)

Amanda left her home to go to a shop to order a new freezer. She met Carla, her friend, along the way and stopped to speak with her. She then continued on to the shop. She ordered a freezer. Then she returned home.

The graph of this story is shown below.



- (a)** Match the different parts of the graph to the statements shown below.

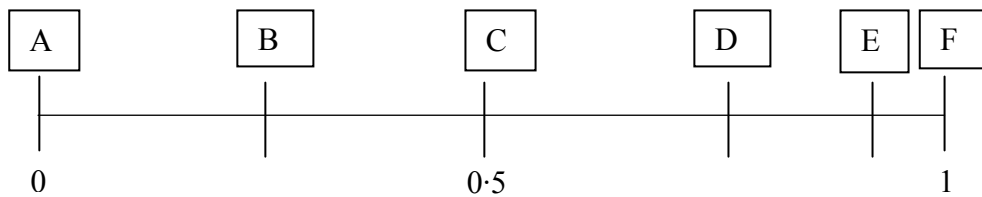
Part of Graph (Put letter in here)	Statement
	Amanda returned home.
	Amanda is in the shop.
	Amanda has just left home.
	Amanda stopped to speak to Carla.
	Amanda, after speaking with Carla, continued on to the shop.

- (b)** The distance from the shop to Amanda's home is 984 m. She walks home in 8 minutes. Find her speed in metres per minute.

Question 7

(suggested maximum time: 2 minutes)

The probability that each of the events A, B, C, D, E and F happens is shown on the scale below.



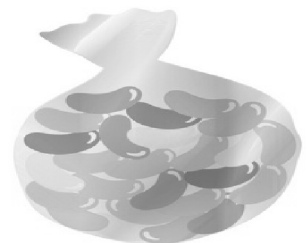
Match the event with the word or phrase which best describes its probability:

Word or Phrase	Event
Fifty-fifty chance	
Certain	
1 in 4 chance	
Almost certain	
Impossible	

Question 8

(suggested maximum time: 5 minutes)

A bag of jelly sweets was opened. The number of sweets of each colour is shown in the table below.



Colour of sweet	Orange	Yellow	Red	Black
Number in bag	6	3	4	2

(a) How many sweets were in the bag? _____

(b) A sweet was taken from the bag.

(i) What is the probability that it was red?

(ii) What is the probability that it was orange or yellow?

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Question 9 (suggested maximum time: 5 minutes)

Question 9 (suggested maximum time: 5 minutes)

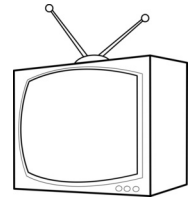
The answers to survey questions can be classified as follows.

- A Categorical data where the categories are not ordered
B Ordered categorical data
C Discrete numerical data
D Continuous numerical data

(a) For each question below, tick (✓) what type of data the answer represents.

	Type of Data			
Question	A	B	C	D
What is your height in centimetres?				
Are you male or female?				
How much money do you earn per week?				
Tick when you were born. Before 1990 ☐ 1990 to 2000 ☐ After 2000 ☐				

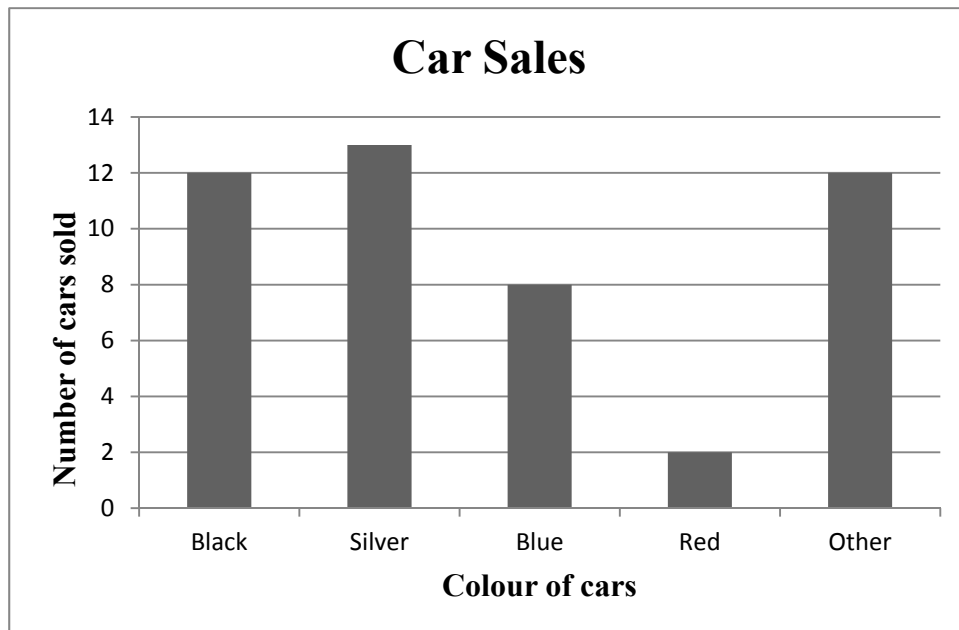
- (b)** A school had 500 boys and 300 girls. A first-year class in the school wanted to find out if students in their school liked a certain TV programme. They decided to do a survey by asking the 16 girls in their class. Give two reasons why this is not a good way to pick the sample.

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.

Question 10 (suggested maximum time: 5 minutes)

Question 10 (suggested maximum time: 5 minutes)

The following bar chart shows the colours of cars sold by a garage during one month.



- (a)** How many cars were sold during the month?

[illegible]

- (b)** What was the most popular colour of car sold?

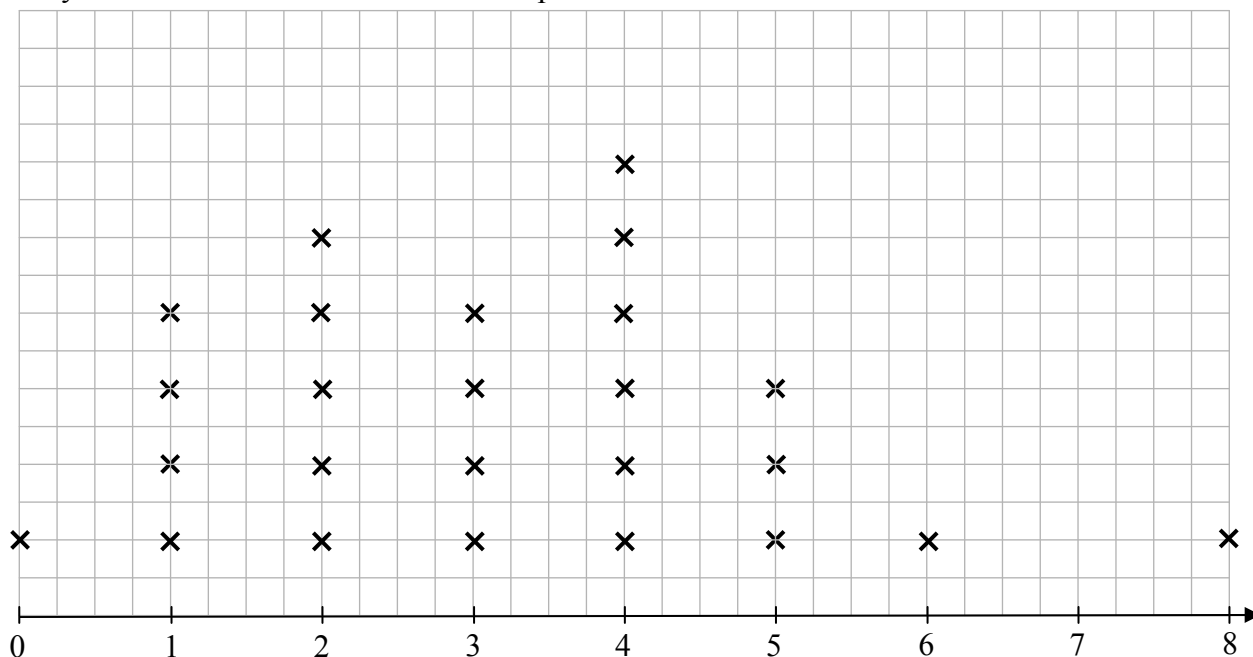
- (c) What percentage of cars sold were blue?

[illegible]

Question 11

(suggested maximum time: 5 minutes)

In a *CensusAtSchool* survey, 25 students were asked how many soft drinks they had in the previous two days. The results are shown in the line plot below.



(a) What is the mode of the data? _____

(b) What is the range of the data? _____

(c) How many students had more than 3 soft drinks? _____

(d) What is the probability that a student chosen at random from this class had less than 2 soft drinks?

Question 12

(suggested maximum time: 5 minutes)

(a) Find the value of $2a + 3b$, where $a = 5$ and $b = 2$.

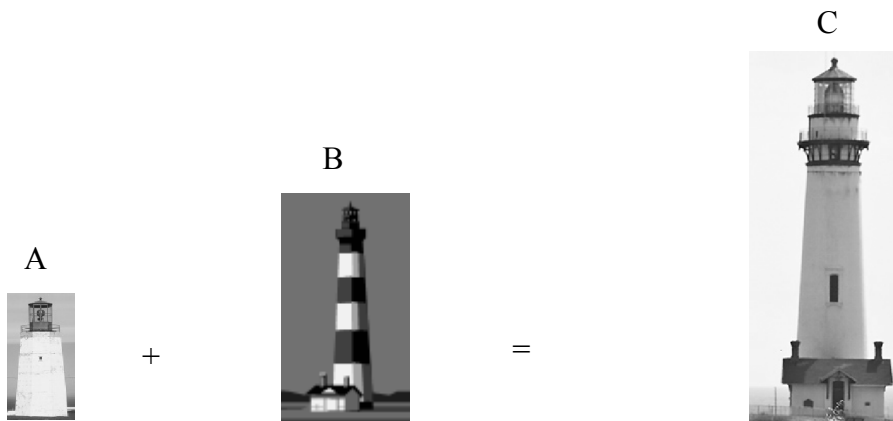
2	(		)	+	3	(		)	=										
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(b) Simplify $(5x + 3y) + 2(2x - y)$.

Question 13 (suggested maximum time: 5 minutes)

Question 13 (suggested maximum time: 5 minutes)

The diagram shows three different lighthouses A, B and C.



- (a) B is twice as high as A. If the height of A is x m, write down the height of B in terms of x .

- (b) The height of A added to the height of B is equal to the height of C. C is 18 m high. Write down an equation in x to represent the above information.

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- (c)** Solve your equation to find the height of lighthouse A.

[illegible]

Question 14

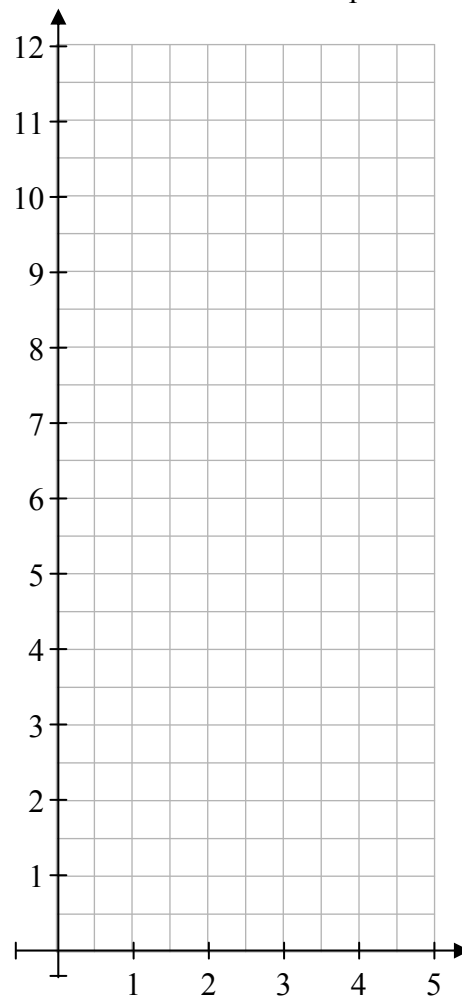
(suggested maximum time: 10 minutes)

The first four numbers of a pattern are

Position	First	Second	Third	Fourth
Number	3	6	9	12

- (a) What is the fifth number in the pattern? _____
- (b) In what position will the number 36 be? _____

- (c)** Plot the points from the table on the co-ordinate plane below.

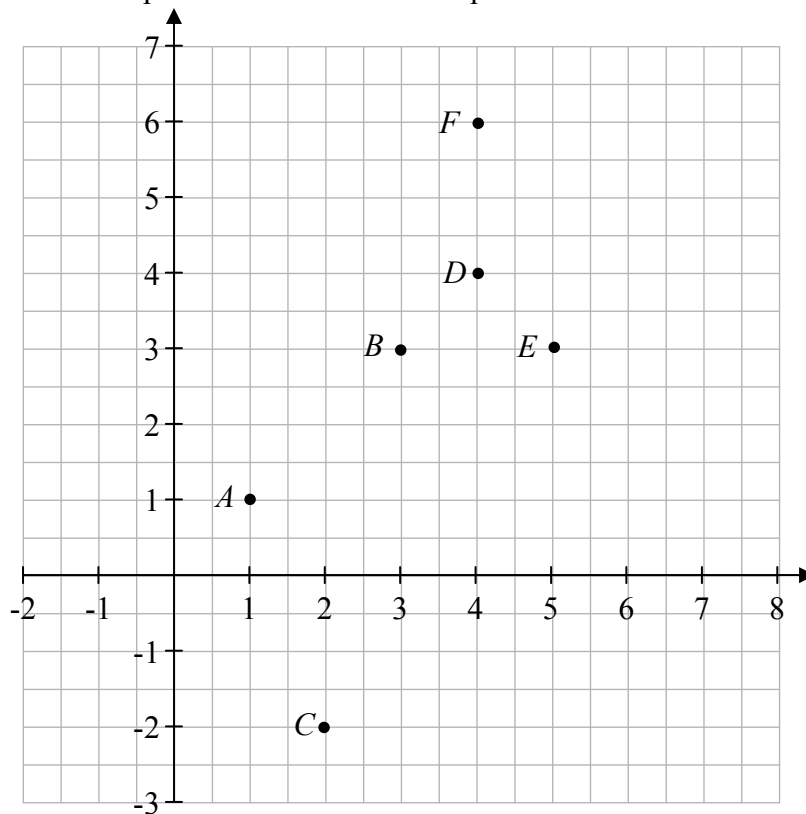


- (d)** Write down how you would show that the relationship between the position and the number is linear.

Question 15 (suggested maximum time: 10 minutes)

Question 15 (suggested maximum time: 10 minutes)

The diagram shows six points on the co-ordinate plane.



- (a)** Write down the co-ordinates of each point described in the table below.

Description	Co-ordinates
The point E .	
The point of intersection of DA and DE .	
The vertex of the angle CAB	
A point on the same line as A and D .	

- (b) Find the mid-point of $[AE]$.

[illegible]

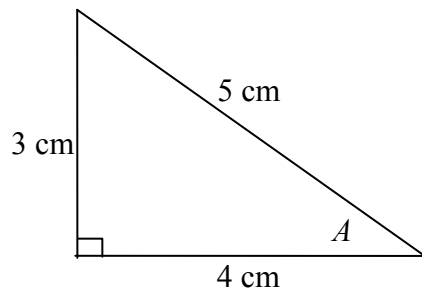
- (c) Find the slope of BF .

[illegible]

Question 16 (suggested maximum time: 2 minutes)

Question 16 (suggested maximum time: 2 minutes)

The diagram shows the angle A in a right-angled triangle.



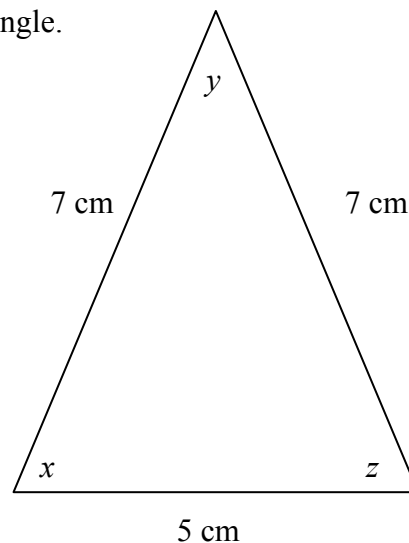
- (a) What is the length of the side opposite the angle A ? _____
- (b) What is the length of the hypotenuse of the triangle? _____
- (c) Write down $\sin A$. $\sin A =$

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Question 17

(suggested maximum time: 5 minutes)

The diagram shows the lengths of three sides of a triangle.



- (a) Which two angles are equal? _____ and _____

- (b)** Why do you think they should be equal?

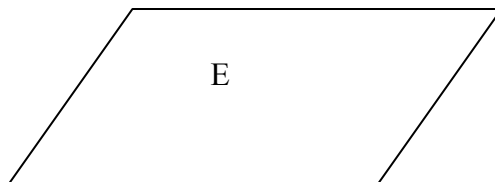
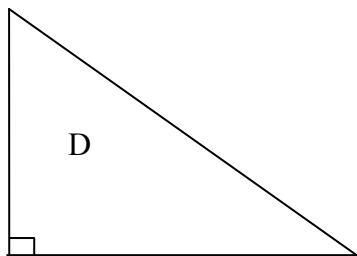
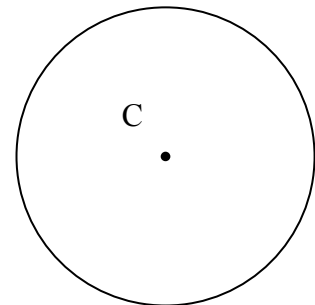
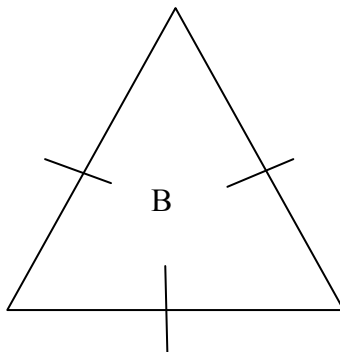
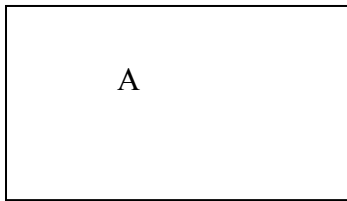
- (c)** Use your protractor to measure the three angles in the triangle.

$$|\angle x| = \underline{\hspace{2cm}} \quad |\angle y| = \underline{\hspace{2cm}} \quad |\angle z| = \underline{\hspace{2cm}}$$

Question 18**(suggested maximum time: 5 minutes)**

The following questions refer to the shapes shown below.

- (a) Draw a diameter in the circle C.
- (b) One of the angles in triangle D is 90° . What kind of triangle is this?
- _____
- (c) Draw a line in the parallelogram E to divide it into 2 congruent triangles.
- (d) The three sides of triangle B are equal. What kind of triangle is this?
- _____
- (e) Draw in the 2 axes of symmetry of the rectangle A.
- (f) Which shape does not have any vertices? _____



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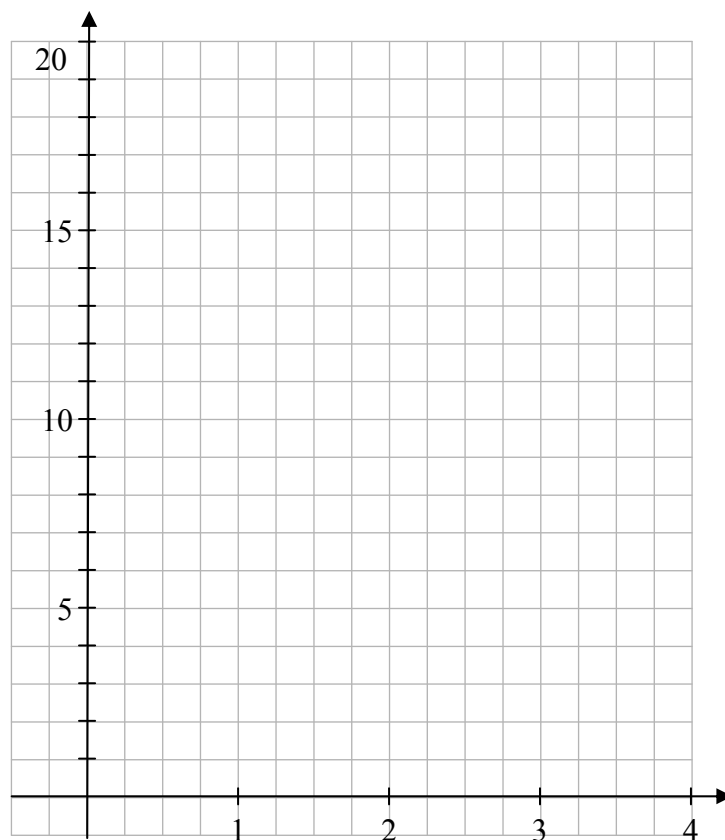
Question 19 (suggested maximum time: 10 minutes)

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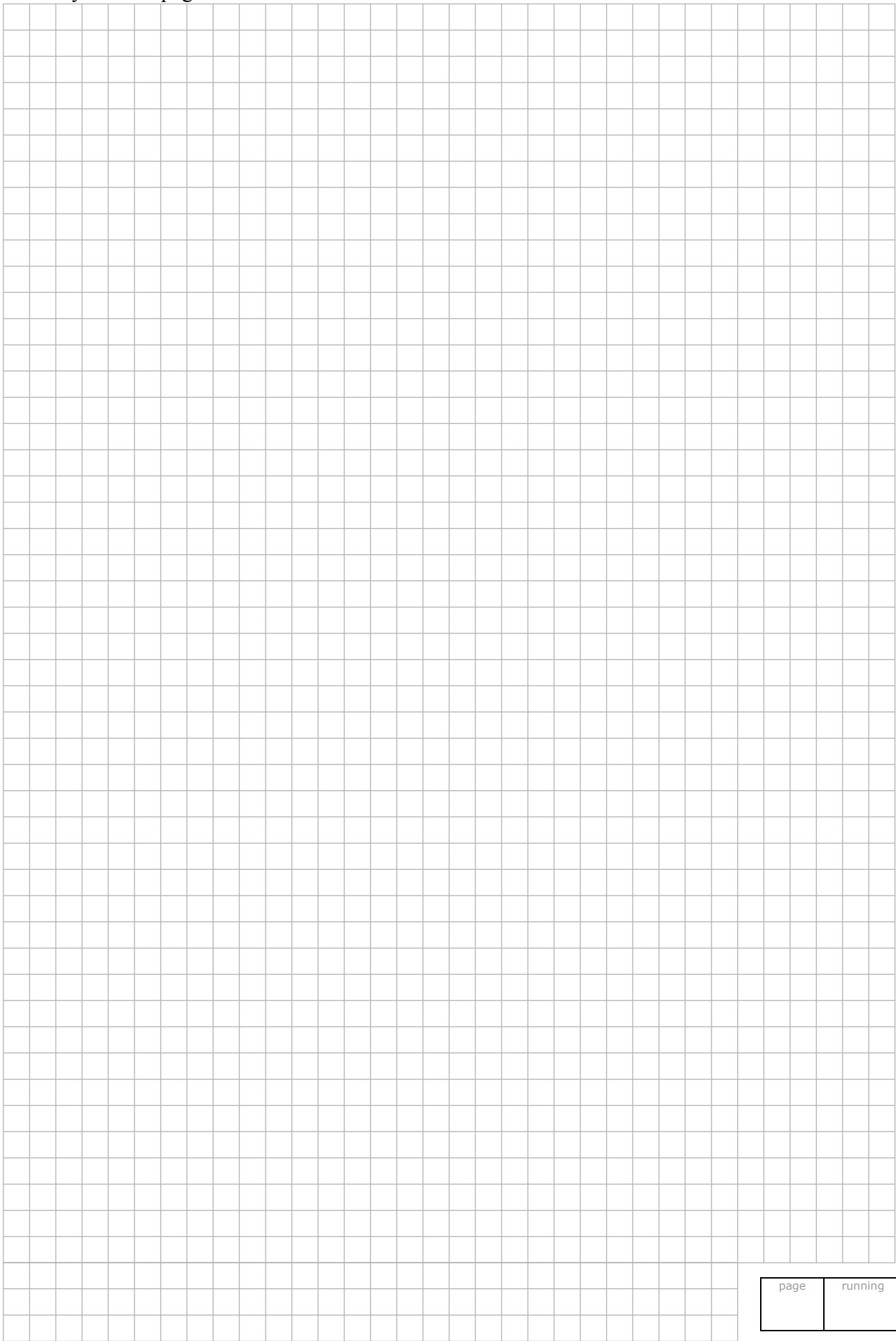
- (a)** Given that $y = 3x + 4$, complete the table below.
Show all your work.

x	1	2	3	4
y			13	

- (b)** Using your answers from **(a)**, draw the graph of $y = 3x + 4$ from $x = 1$ to $x = 4$.

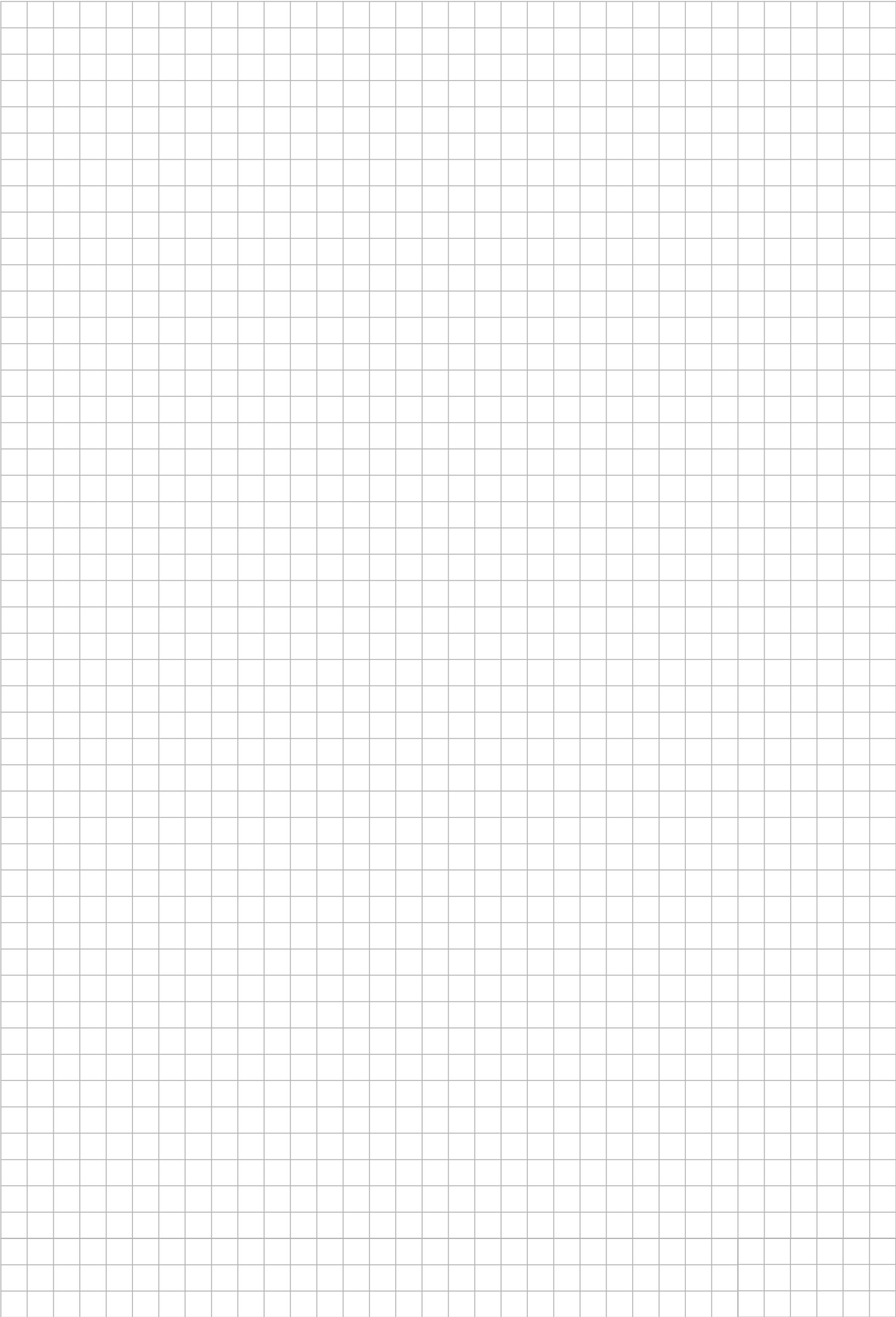


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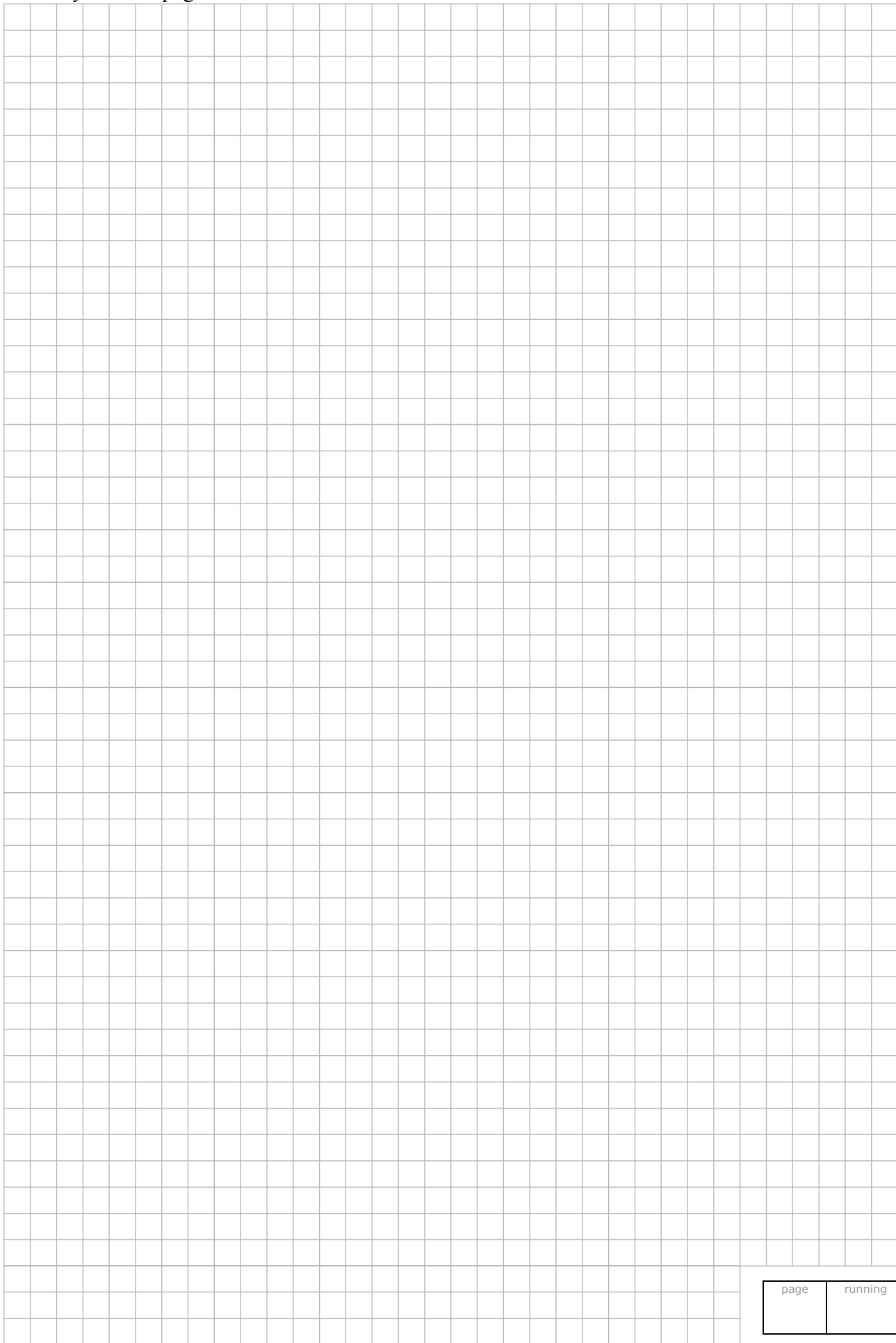


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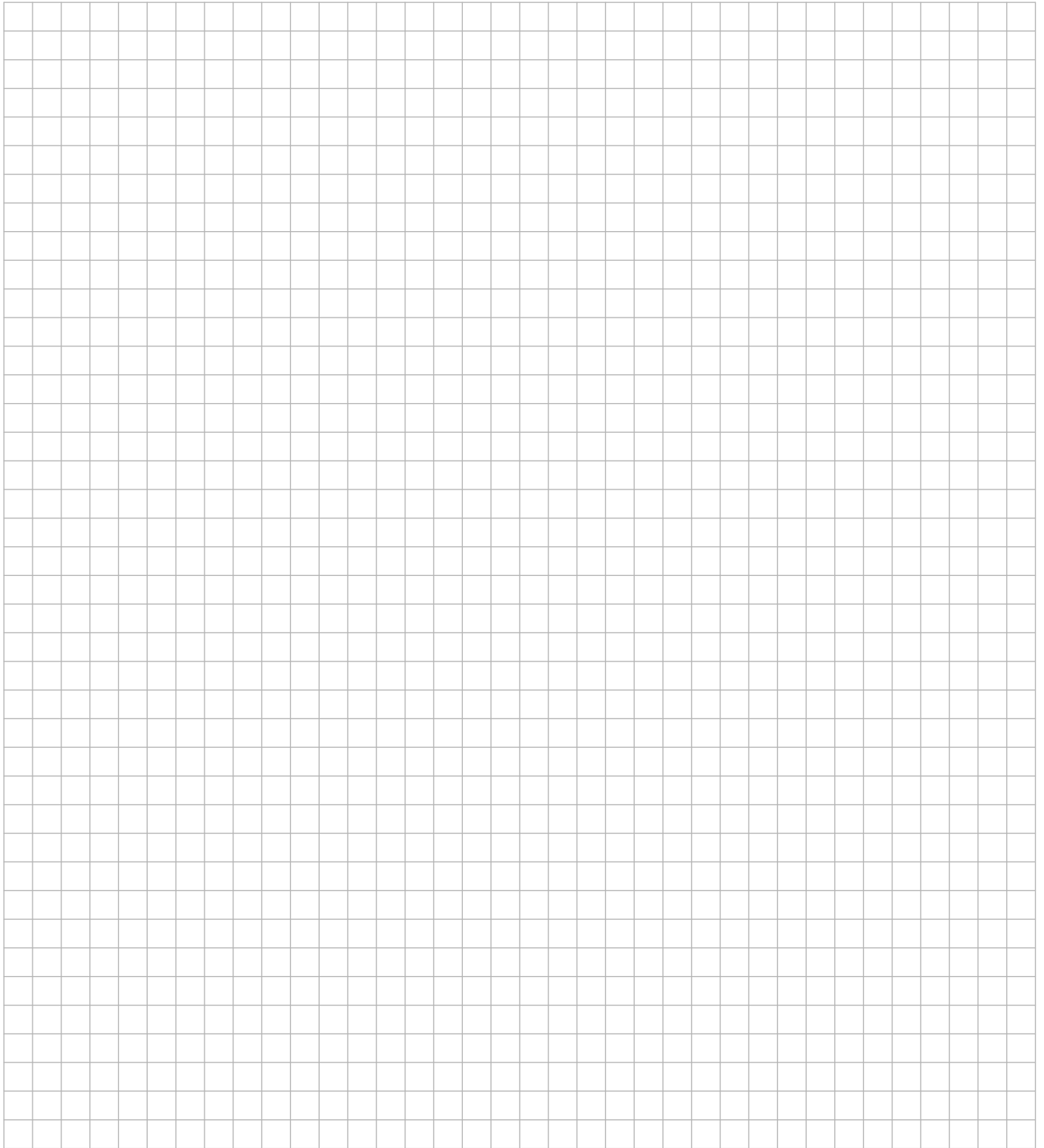
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Mathematics (Project Maths – Phase 2)

Friday 8 June

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