2025.S32

2025J003G1EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Final Examination 2025

Mathematics

Ordinary Level

Friday 6 June Afternoon 1:30 - 3:30

270 marks

Examination Number

Date of Birth

For example, 3rd February 2005 is entered as 03 02 05

Centre Stamp

Instructions

There are 14 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 Examination Number in the box on the front cover.

Write your answers in blue or black pen. You may use pencil in graphs and diagrams only.

This examination booklet will be scanned and your work will be presented to an examiner on screen. Anything that you write outside of the answer areas may not be seen by the examiner.

Write all answers into this booklet. There is space for extra work at the back of the booklet.
If you need to use it, 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.

In general, diagrams are not to scale.

You may lose marks if your solutions do not include supporting work.

You may lose marks if you do not include the appropriate units of measurement, where relevant.

You may lose marks if you do not give your answers in simplest form, where relevant.

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

Question 1 **(Suggested maximum time: 5 minutes)**

(a) Calculate the value of each of the following:

(i) $456 - 321$

(ii) $7{\cdot}4 \times 6{\cdot}2$

(iii) $\sqrt{9} \times (7 - 3)$

(b) The ages of Jael, Alice, and Paul are shown in the table below.

(i) Complete the table to show the ages of Jael, Alice, and Paul in 4 years' time.

	Age now	**Age in 4 years' time**
Jael	16	
Alice	12	
Paul	11	

(ii) Work out the **mean age** of Jael, Alice, and Paul in 4 years' time.

Question 2 **(Suggested maximum time: 5 minutes)**

(a) Noah buys **3 bars** of chocolate at the local shop.
Each bar costs the same.

He pays €20 and gets €13·40 in change.
Work out the cost of **1** bar of chocolate.

(b) Noah has €13·40.
He divides the money between himself and his friend Amy in the **ratio** 3 : 2, respectively.

Work out how much money each person gets.

Noah =

Amy =

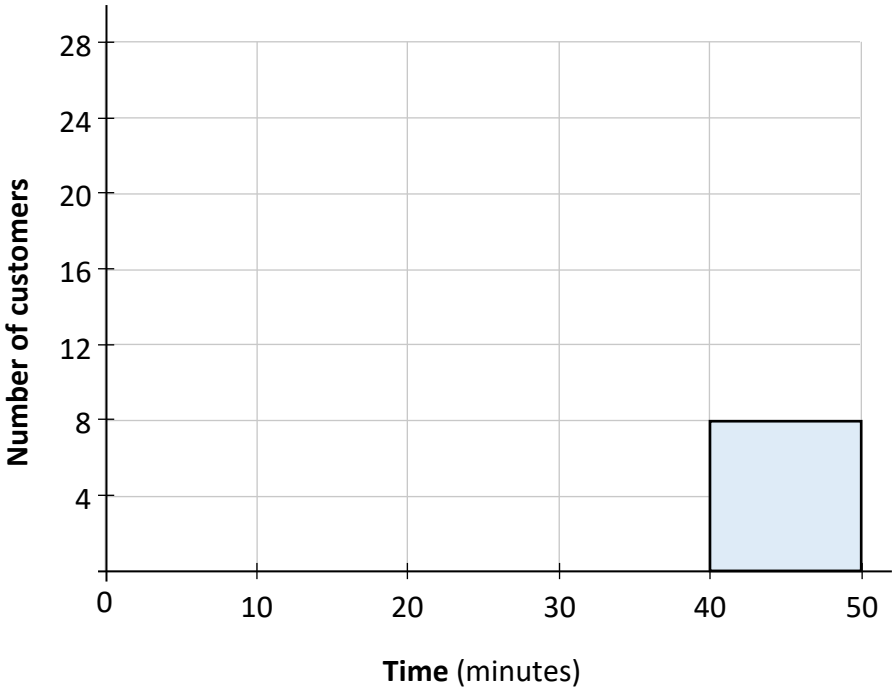
Question 3 **(Suggested maximum time: 5 minutes)**

The table below shows the length of time customers spent in a café on a particular day.

Time (minutes)	$0-10$	$10-20$	$20-30$	$30-40$	$40-50$
Number of customers	12	18	16	24	8

(Note: '$10-20$' means 10 minutes or more, but less than 20 minutes, and so on.)

(a) Complete the histogram below to show the information in the table.



(b) Find the **total** number of customers who visited the café on that day.

(c) What is the **greatest** possible number of customers that could have spent **less than 15 minutes** in the café on that day?

Question 4 **(Suggested maximum time: 5 minutes)**

A rectangular flag has a length of 100 cm and a width of 60 cm, as shown in the diagram below.

(a) Work out the **area** of the rectangular flag, in cm^2.

(b) The flag has a circle inside the rectangle.
The radius of the circle is 21 cm.

Work out the **area** of the circle.
Give your answer correct to the nearest cm^2.

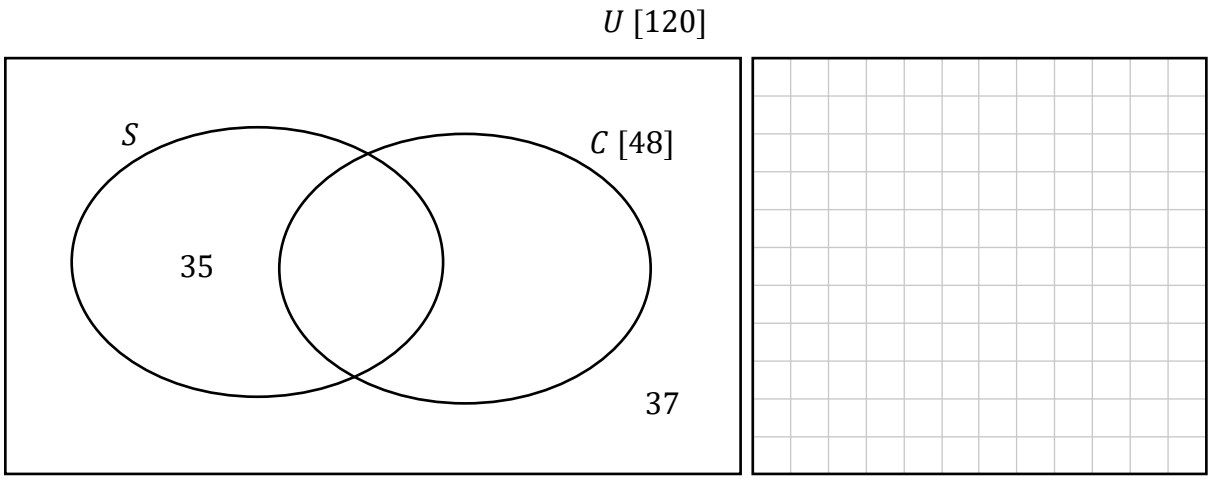
$A = \pi r^2$

Question 5 **(Suggested maximum time: 5 minutes)**

In a survey of 120 students in Harmony Haven School:

30 play **both** sport (S) **and** computer games (C)
48 play computer games.

(a) Use the above information to complete the Venn diagram below.



(b) How many students play **neither** sport **nor** computer games?

(c) $\#(S \backslash C) = 35$.
Explain what this statement means, in terms of what students in the school play (sport and computer games).

(d) One student is picked at random from the 120 students who were surveyed.
What is the probability that this student plays sport **or** computer games but **not** both?

Question 6 **(Suggested maximum time: 10 minutes)**

(a) A sports shop sells 3 different brands of running shoes. Each brand comes in the 4 different colours shown the table below.

Brand	Colour
A	Red
B	Blue
C	Black
	Yellow

How many **different** choices of running shoe does the shop sell?
For example, one choice would be brand **B** and yellow.

(b) Tom writes down a list of five numbers, from smallest to biggest.
Two of these numbers are shown below.

$$2, \quad \square \ , \quad \square \ , \quad 10, \quad \square$$

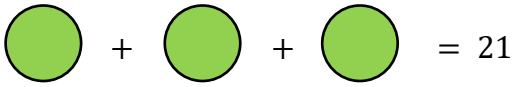
The **mode** of these five numbers is 2.
The **median** of these numbers is 7.
The **range** is 12.

Use this information to find the three missing numbers from Tom's list, and write them into the spaces above.

Question 7 **(Suggested maximum time: 5 minutes)**

In this question, each shape has a fixed value.

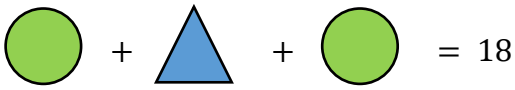
(a) **(i)** Work out the value of a circle, using the following equation:



= 21

= _____

(ii) Work out the value of a triangle, using the following equation, and your answer to part **(a)(i)**:



= 18

= _____

(b) Two equations are shown below.
Work out the value of a hexagon and the value of a square.

= 24

= 13

= _____

= _____

Question 8 **(Suggested maximum time: 10 minutes)**

(a) Eight numbers are given in the table below.

1	3	8	12
15	24	30	60

From the numbers in the table, write down:

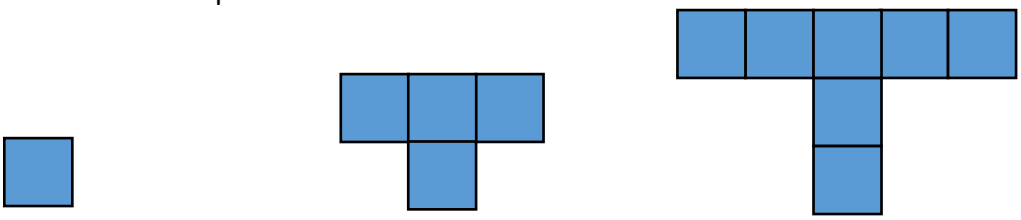
(i) an even number

(ii) the lowest common multiple (LCM) of 12 and 15.

(b) The number 36 has nine positive **factors**. Four of these factors are given below.
Fill in the remaining five factors of 36 in the boxes provided.

1, 2, 3, ☐, ☐, ☐, 12, ☐, ☐

(c) The first three patterns in a sequence are shown below.
Each pattern is made of squares.



Pattern 1 Pattern 2 Pattern 3

(i) Draw Pattern 4 in the sequence.

(ii) Fill in the table to show the number of squares in each of the first 4 patterns.

Pattern	Number of squares
1	
2	
3	7
4	

(iii) What kind of sequence is made by the number of squares in each pattern?
Give a reason for your answer.

Answer: Linear ☐ Non-linear ☐
(Tick (✓) **one** box only)

Reason:

Question 9 **(Suggested maximum time: 10 minutes)**

Alice gets €100 for her birthday, and puts it in a bank account.
She puts a further €25 in the bank account **every month** for 6 months.

(a) Work out how much **in total** she will have in the bank account at the end of the 6 months.

(b) Alice puts €130 in a post office savings account.
The annual interest rate is 3%.

(i) Work out how much **interest** Alice gets in one year.

(ii) Work out the **total** amount of money in the account after one year.

(c) Alice puts €120 in a Credit Union account. This account earns interest.
At the end of one year, she has €124·56 in the account.

Find the **percentage** annual interest rate for this account.

Question 10 **(Suggested maximum time: 10 minutes)**

(a) Find the value of $3p + 7q$, when $p = 2$ and $q = 11$.

(b) Multiply out **and** simplify:

$$2(5a - 3) - 4a + 7$$

(c) Solve the following equation in y:

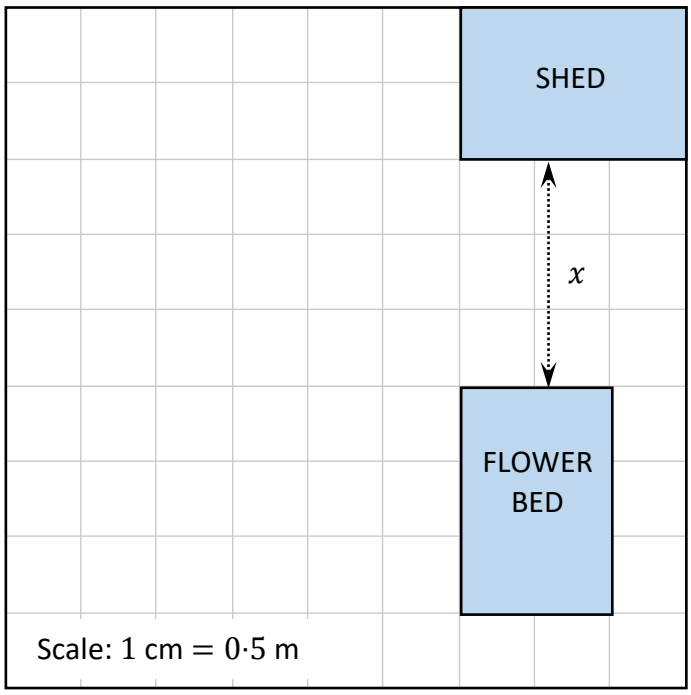
$$8y + 4 = 2y - 8$$

(d) Factorise the quadratic expression $x^2 - 10x + 21$.

$x^2 - 10x + 21 = (x - 3)($ $)$

Question 11 **(Suggested maximum time: 10 minutes)**

Tanya draws a scaled diagram of her garden, as shown below.
The diagram includes a shed and a flower bed.



(a) 1 cm on the diagram represents an actual distance of 0·5 m.

(i) Write down the distance marked x on the diagram. Give your answer in cm.
Hence, find the **actual** distance from the shed to the flower bed, in metres.

Distance on the diagram (cm): _____ Actual distance (m): _____

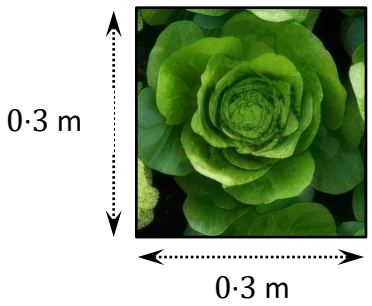
(ii) Work out the **actual perimeter** of the flower bed.

(iii) Tanya wants to put a vegetable patch in the garden.
The vegetable patch will be rectangular, with a length of 3 m and a width of $1{\cdot}5$ m.

Draw the vegetable patch in a position on the diagram **on the previous page** so that it does not overlap with the shed or the flower bed.

(b) Tanya decides to plant cabbage in the vegetable patch.
She reads that each cabbage needs a square space of $0{\cdot}3$ m by $0{\cdot}3$ m.

According to this, what is the maximum number of cabbages that Tanya should plant in this vegetable patch?
Remember that the vegetable patch will have a length of 3 m and a width of $1{\cdot}5$ m.



Question 12 **(Suggested maximum time: 10 minutes)**

Jael buys a pizza.

(a) Jael orders his pizza at $19{:}50$.
It is delivered 45 minutes later.

What time does his pizza arrive?

(b) The pizza is in a closed rectangular box with dimensions:

Length $= 28$ cm

Width $= 25$ cm

Height $= 4$ cm

(i) Work out the **volume** of the pizza box.

(ii) Work out the **surface area** of the pizza box.
Give your answer in cm^2.

(c) A pizza costs €14 in Limerick.
The same pizza costs £12 in London.
The exchange rate is €1 = £0·93.

Work out which pizza is **cheaper**.
Use calculations to support your answer.

The pizza is cheaper in:	Limerick	London
Tick (✓) **one** box only.	☐	☐

Calculations:

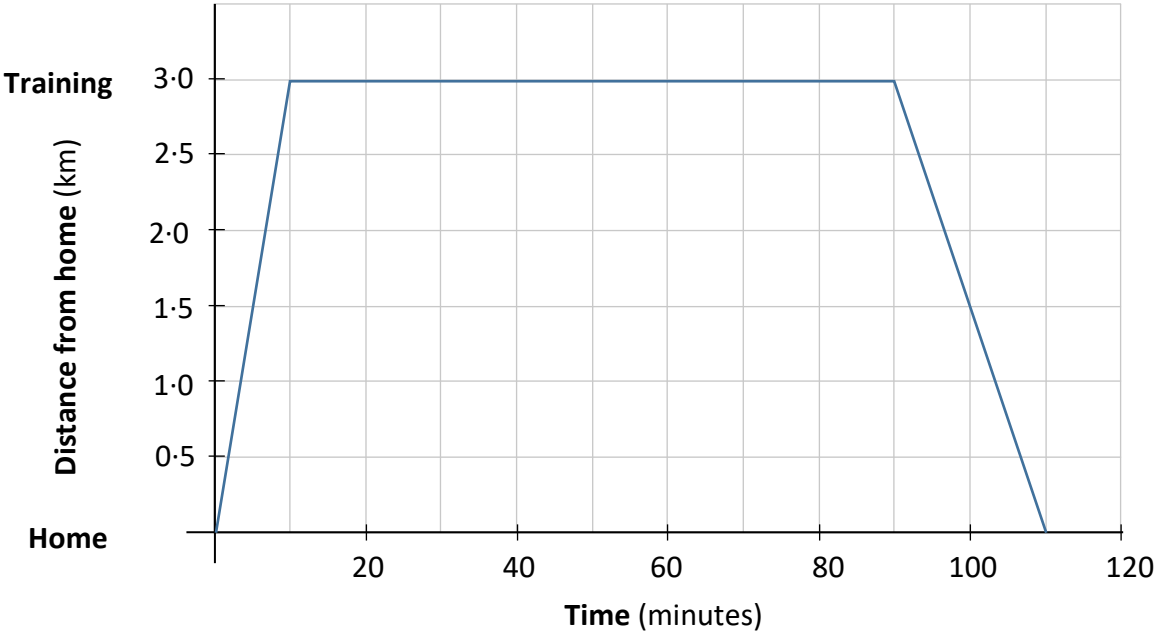
Question 13 **(Suggested maximum time: 10 minutes)**

Tadhg usually cycles 3 km to football training.

(a) It takes Tadhg 10 minutes to cycle to training.
Work out his average speed, in km/hour.

(b) Below is a distance-time graph showing how far Tadhg's bike is from his home, along the route travelled, for one of the days that he goes training.

Use the information in the graph to answer parts **(b)(i)**, **(b)(ii)**, and **(b)(iii)**.



(i) How long was Tadhg away from home, **in total**? Give your answer in minutes.

(ii) How long was Tadhg at training? Give your answer in hours and minutes.

(iii) Was Tadhg quicker cycling **to** training or on the way **home from** training?
Using the graph, give a reason for your answer.

Tadhg is quicker cycling:	**to** training	**home from** training
Tick (✓) **one** box only.	☐	☐

Reason:

(c) The first year and second year students train together.
Each year is divided into two teams, the red team and the blue team.
The table below shows the number of students in each team.

	First year	**Second year**
Red	18	10
Blue	17	15

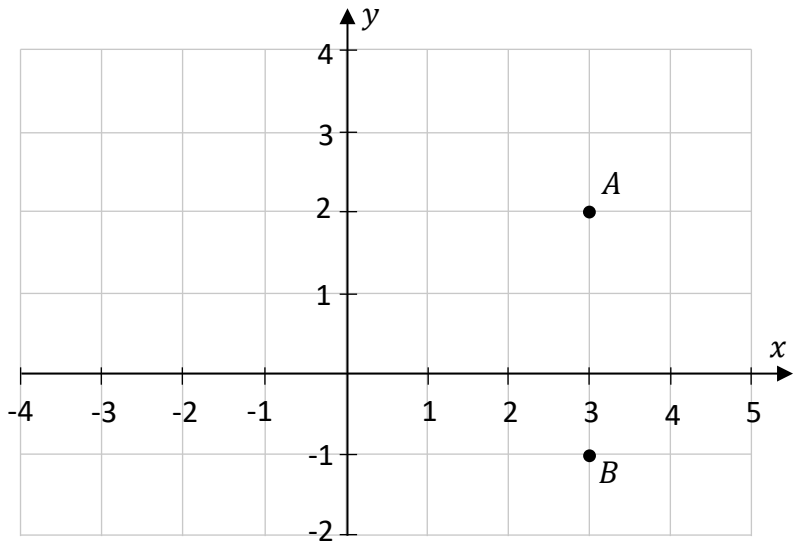
There are 60 students in total.
One student is picked at random.

(i) What is the probability that the student is a **first year** on the **red** team?

(ii) What is the probability that the student is on the **blue** team?

Question 14 **(Suggested maximum time: 10 minutes)**

(a) The points A and B are shown on the co-ordinate diagram below.



(i) Write down the co-ordinates of the point A and the point B.

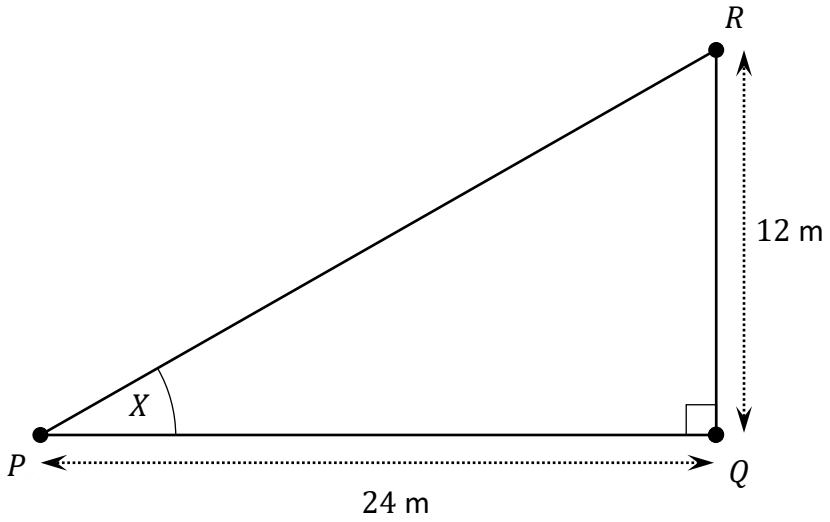
$A =$ (,) $B =$ (,)

(ii) Write down the **length** $|AB|$.

(iii) The point C is $(-4\,,2)$.
Plot and label the point C on the co-ordinate diagram above.

(iv) Work out the **slope** of BC.
Give your answer as a fraction.

(b) The diagram below shows the triangle PQR.
$|PQ| = 24$ m, $|QR| = 12$ m, and $|\angle PQR| = 90°$.
The angle at P is marked X.

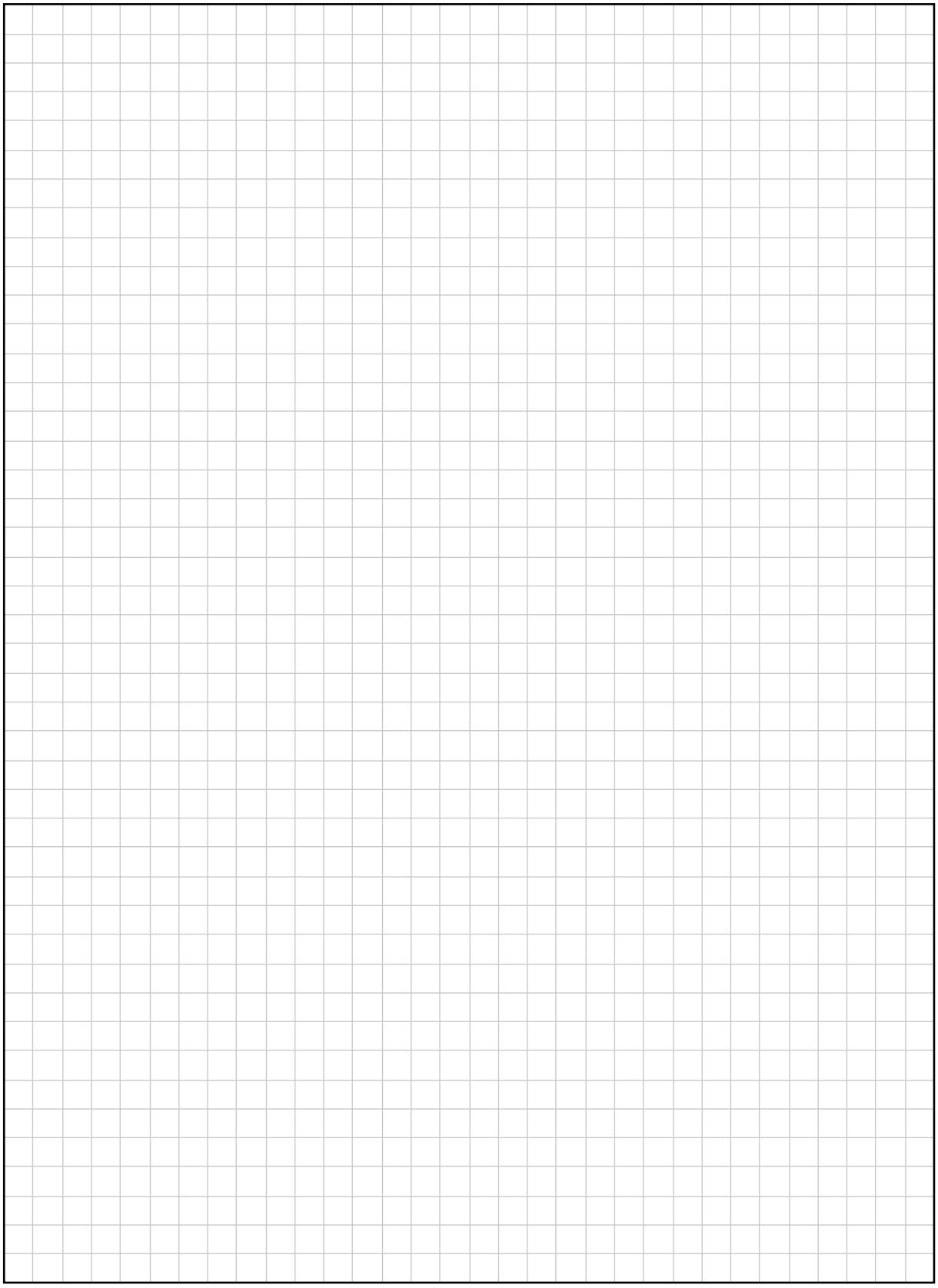


(i) Which of the following is correct? Tick (✓) **one** box only.

$\sin X = \frac{12}{24}$ ☐ $\quad$ $\cos X = \frac{12}{24}$ ☐ $\quad$ $\tan X = \frac{12}{24}$ ☐

(ii) Hence, use your calculator to find the size of the angle X, correct to the nearest degree.

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



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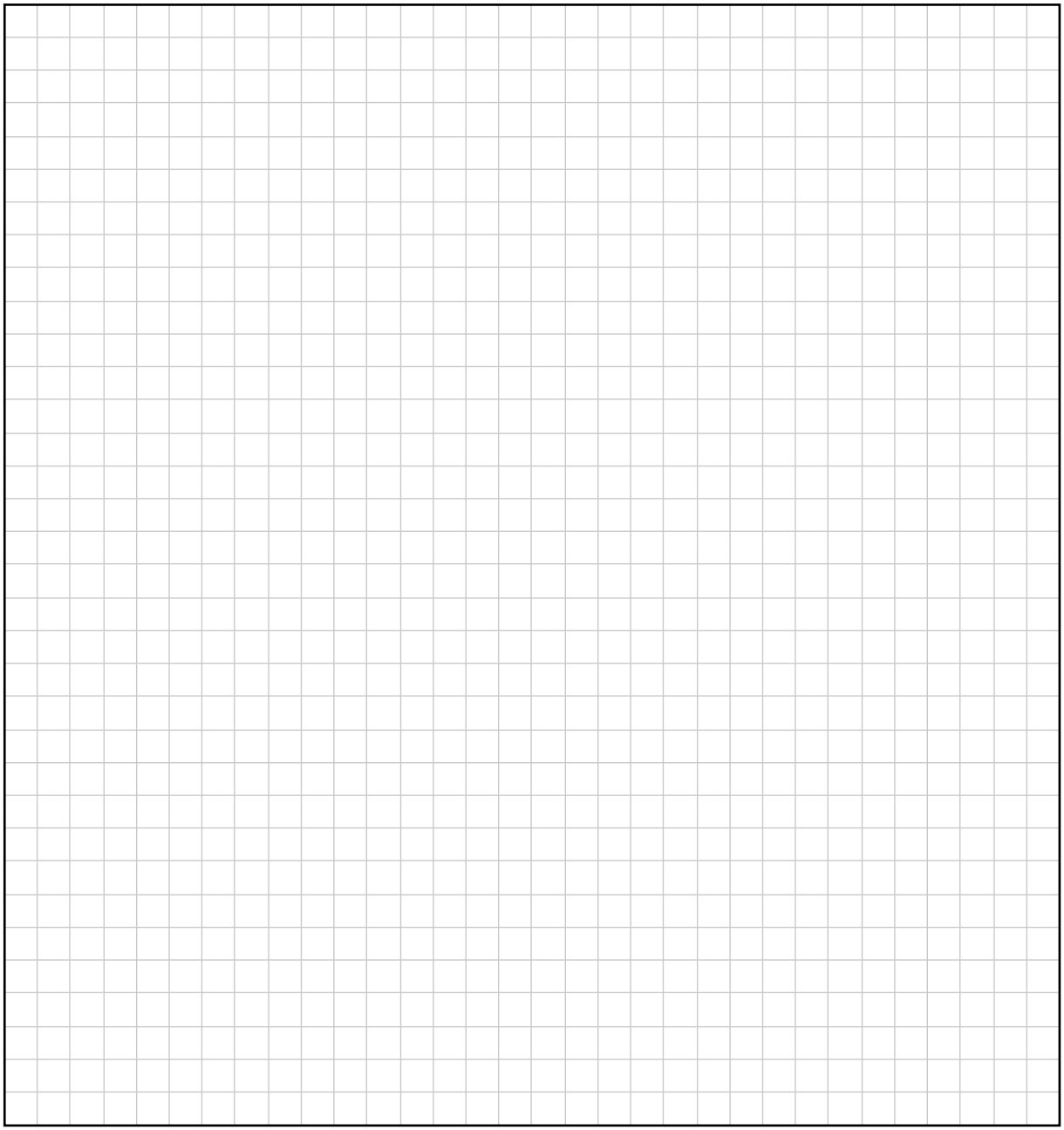

Acknowledgements

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