



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2018

Mathematics

Foundation Level

Friday, 8 June – Afternoon, 2:00 to 4:30

300 marks

Examination number

Centre stamp

Running total	
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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	200 marks	8 questions
Section B	100 marks	2 questions

Answer all ten questions.

Write your answers in the spaces provided in this booklet. You may lose marks if you do not do so. 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 may lose marks if your solutions do not include supporting work.

You may lose marks if the appropriate units of measurement are not included, where relevant.

You may lose marks if your answers are not given in simplest form, where relevant.

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

Section A

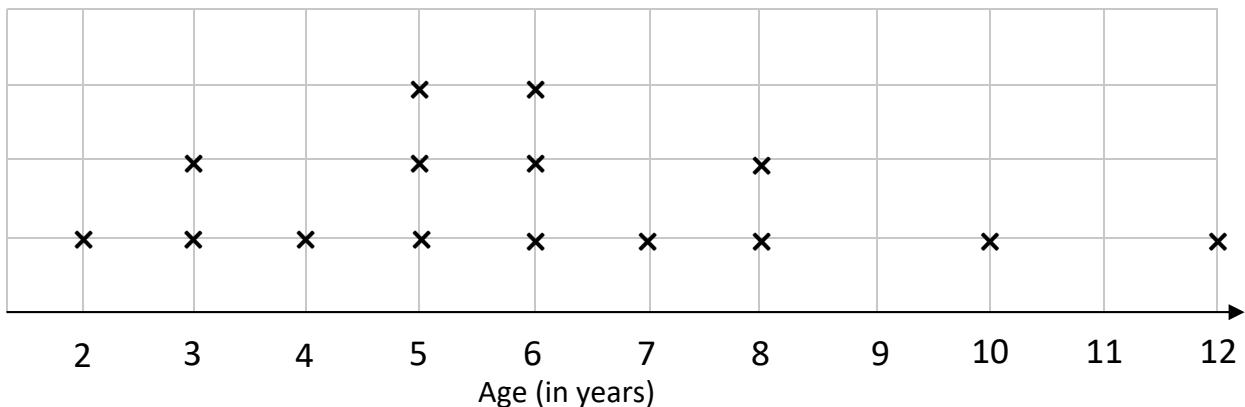
200 marks

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

Question 1

(25 marks)

The line plot below shows the ages (in years) of a group of children.



- (a) Find the total number of children in the group.

- (b)** Find the mean (average) age of the children in the group.

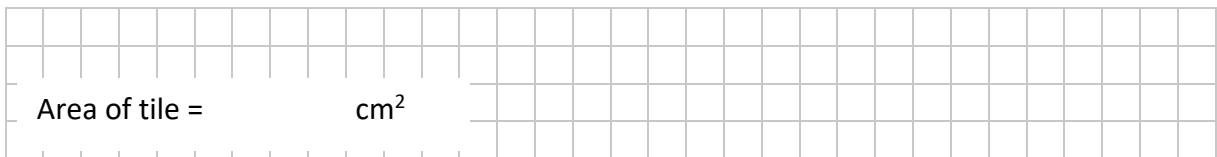
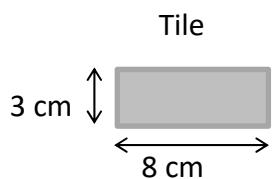
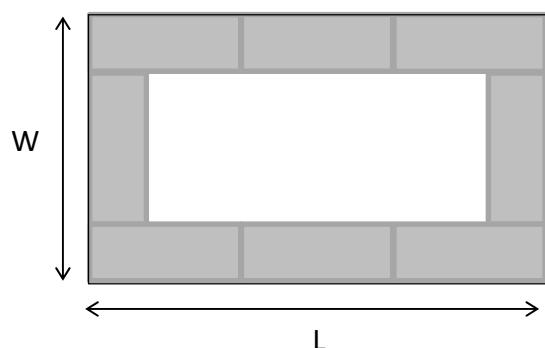
- (c) Write down the range of the ages of the children in the group.

- (d) What percentage of the children in the group are aged 7 years or older?

Question 2**(25 marks)**

Figure 1 below shows a rectangular tile which is 8 cm long and 3 cm wide.

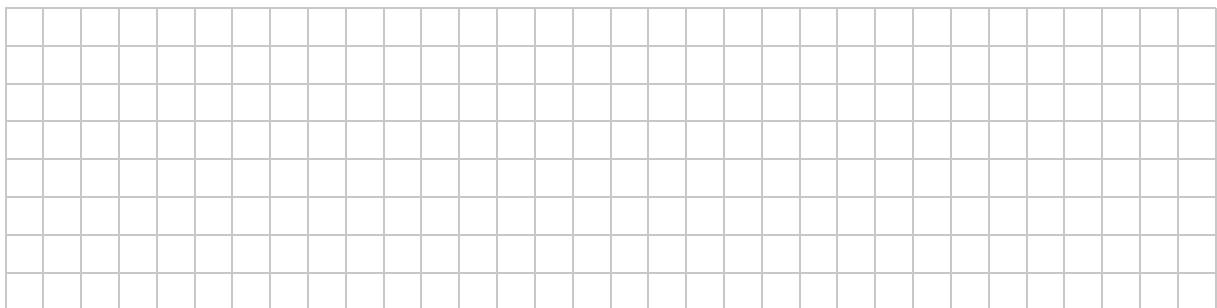
- (a) (i) Find the area of the tile.

**Figure 1****Figure 2**

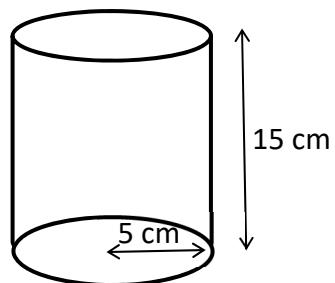
- (ii) Eight of these tiles are joined to make a rectangular shape, as shown in **Figure 2**.
Find the value of **L** and the value of **W**.
Hence find the area of the rectangular shape that includes the tiles.

Length (L)	=	cm
Width (W)	=	cm
Area	=	cm^2

- (iii) Hence, or otherwise, find the area of the white rectangle in the centre of **Figure 2**.



- (b) Ruairí needs to bring at least 1000 cm^3 of water from a well near his home to his school science class. Ruairí has a cylindrical container with the measurements shown in the diagram below.



Will this container be large enough?

Justify your answer by finding the volume of the container.

Calculations:

Answer:

Question 3

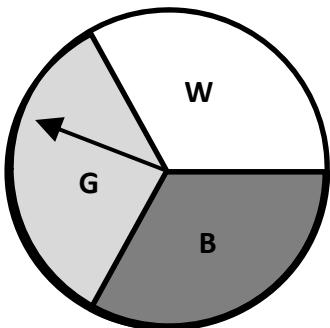
(25 marks)

Two identical fair spinners are divided into three equal sections as shown.

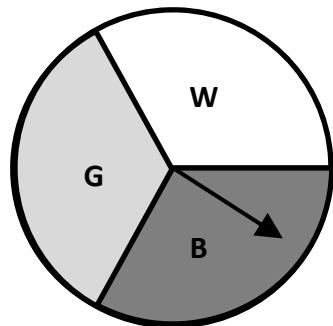
The sections are coloured Black (B), Grey (G) and White (W).

The spinners are spun at the same time and the colours in which the pointers end up are noted.

First Spinner



Second Spinner



- (a) (i) Complete the table below to list all the possible outcomes.

One is already done and G , B means Grey on the first spinner and Black on the second spinner.

		First Spinner		
		Black	Grey	White
Second Spinner	Black		G, B	
	Grey			
	White			

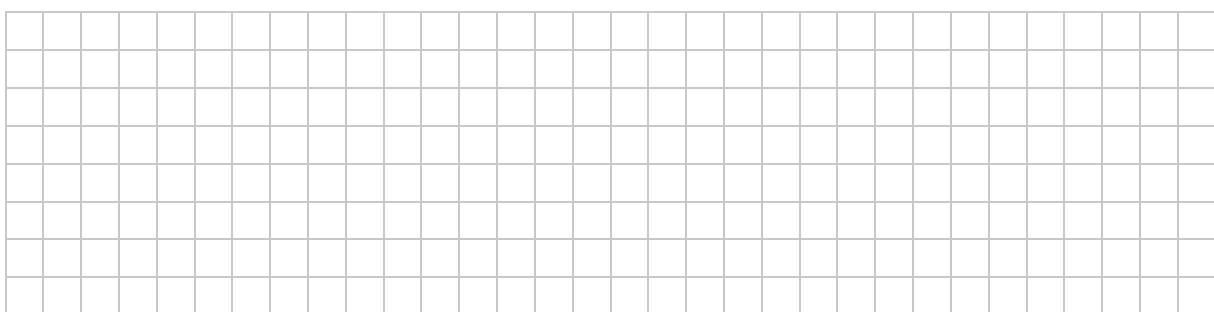
- (ii) Find the probability of getting the same colour on each spinner.

- (iii) Find the probability that the colour on one of the spinners is black and the colour on the other spinner is white.

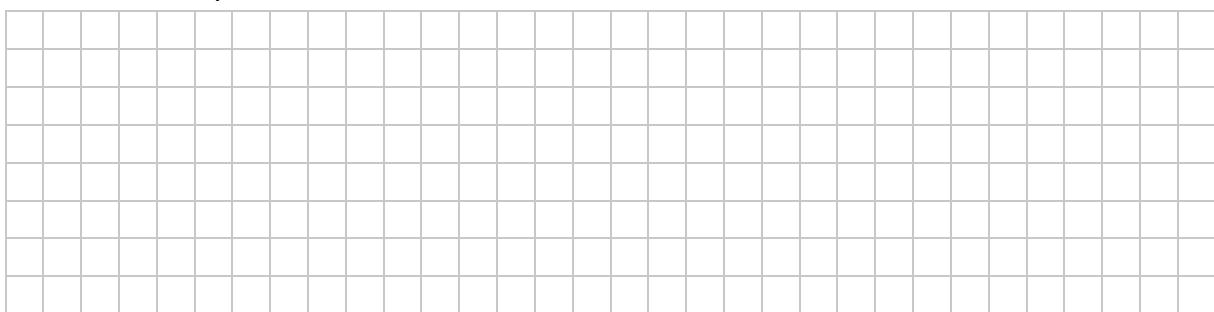
- (b)** Gráinne is choosing her activities for Transition Year.
She must choose 1 activity from each of the groups below.
For example, she might choose Swimming, Bridge, and Art.

Activities		
Group 1	Group 2	Group 3
Swimming	Chess	Creative Writing
Basketball	Bridge	Drama
Hurling		Art

- (i)** How many different combinations of activities does Gráinne have?



- (ii)** Because of an injury, Gráinne cannot take part in basketball or hurling.
How many different combinations of activities does she have now?



Question 4

(25 marks)

- (a) (i) Fiachra invests €10 000 for 3 years at 3·25% per annum compound interest. How much does his investment amount to at the end of the 3 years? Give your answer correct to the nearest cent.

- (ii) Caoimhe also invests €10 000 for 3 years. At the end of the 3 years she gets a one-off interest payment of 10%. Who gets the most return on his/her investment **and** what is the difference between their final amounts?

Answer:	
Difference:	

- (b)** Amanda exchanges £150 sterling for euro. The exchange rate is €1 = £0.916. How much does she get? Give your answer correct to the nearest cent.

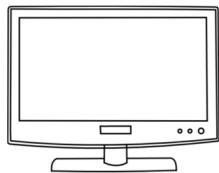
Question 5

(25 marks)

Jamil is planning to buy a new television.

The model he has chosen can be bought in three different shops.

Find how much the television would cost Jamil in each of the three shops.



- (a) Shop 1

He would pay a deposit of €200 plus €25 per month for 12 months.

- (b) Shop B**

The usual price is €600. There is a sale with a reduction of 20% off the usual price.

- (c) Shop C**

Jamil would pay €22 per month for 2 years.

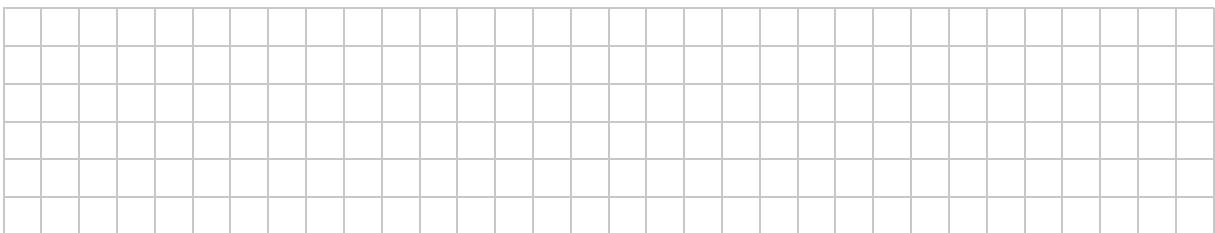
- (d) From which shop should Jamil buy the television if he wants to spend the least amount of money overall?

Question 6**(25 marks)**

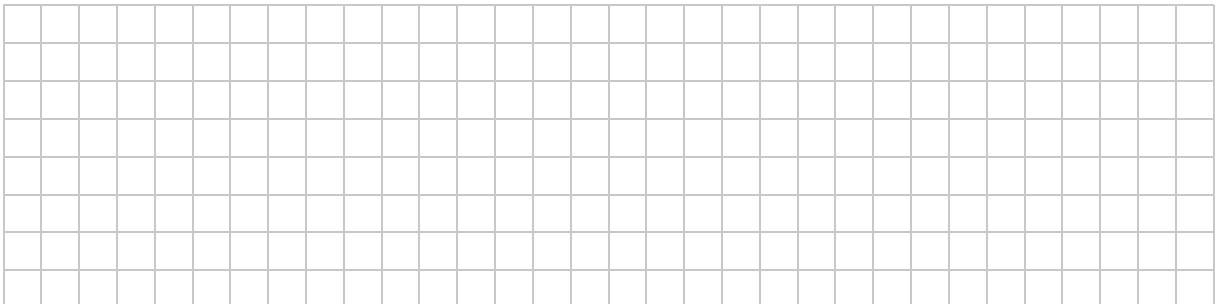
- (a) (i) Sinead creates a pattern of numbers using the instructions in the table below.
The first number, 10, is filled in for you.
Fill in the missing numbers in the table.

Instruction			
Starting Number	10	11	12
Multiply by 3	10×3		
Add 12 to your answer	$30 + 12$		
Outcome	42		

- (ii) Sinead picks a new starting number and gets an outcome of 60.
Find the number she picked.



- (b) A number of 4-legged stools and 3-legged stools has a total of 17 legs between them.
How many 4-legged stools are there?



Question 7

(25 marks)

- (a) Write the following numbers in order, starting with the smallest: 73%, $\frac{3}{4}$, 0.7, $\frac{4}{5}$.

- (b) (i)** The population of India is estimated to be about 1 343 000 000 people. Write this number in the form $a \times 10^n$, where $1 \leq a < 10$ and $n \in \mathbb{Z}$.

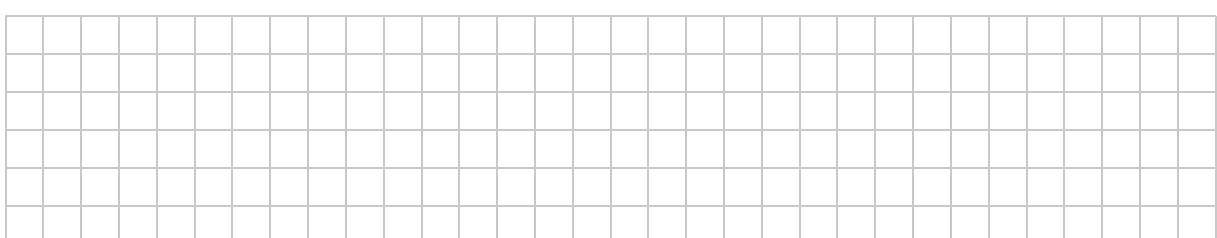
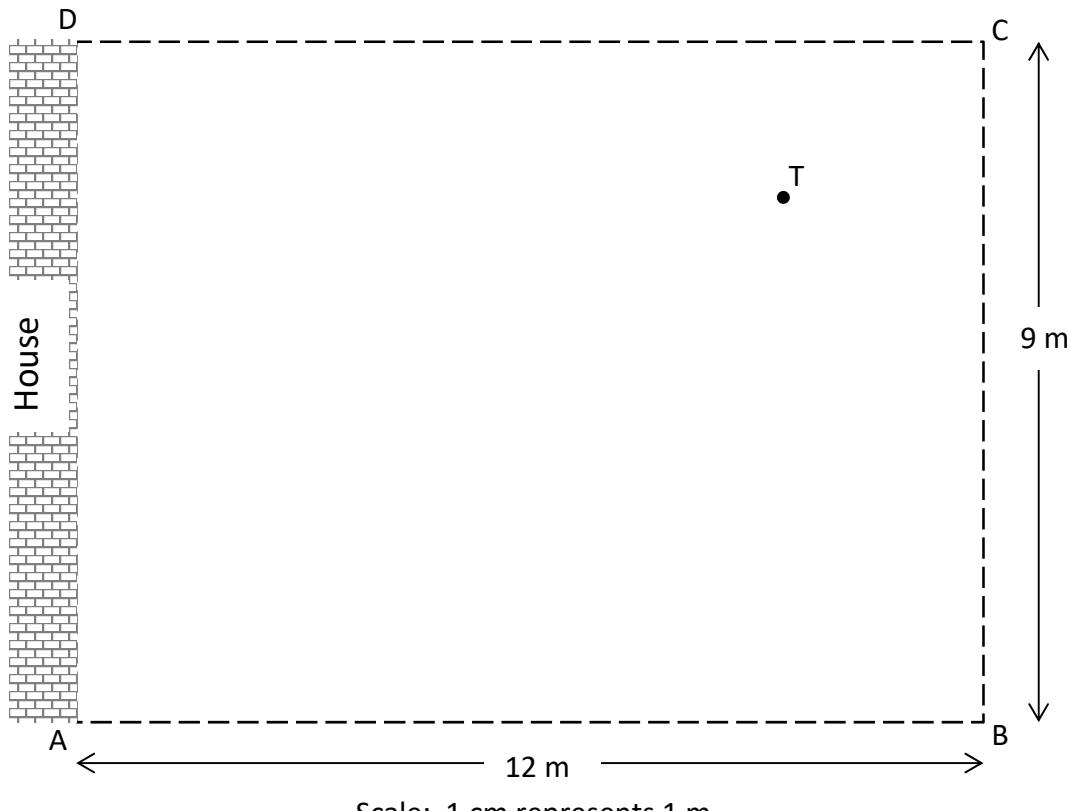
- (ii) Mary is taking a trip to India and is texting a friend about the population of that country. Write the number 1 343 000 000 in words.

- (c) (i) There are 60 people at a party. The ratio of adults to children is 1:5. How many adults are at the party?

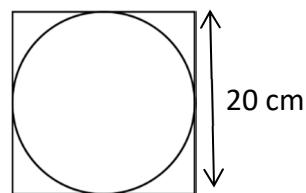
- (ii) 8 more adults join the party and none of the children leave.
What is the ratio of adults to children now?

Question 8**(25 marks)**

- (a) Sully's back garden is in the shape of the rectangle ABCD shown in the scaled diagram below. In the diagram 1 cm represents 1 m.
[AD] is the back wall of the house.
There is a tree (T) near the end of the garden, as shown in the diagram.
Sully wants to put up a bird table in the garden. The table has to be at least 3 m from the house and at least 4 m from the tree. Using your ruler and compass, **draw and shade in** the region of the garden where the bird table could be placed.



- (b)** A square board with a circular disc drawn on it is shown in the diagram below. The square has a side length of 20 cm.



- (i) Find, in cm^2 , the area of the square.

- (ii) Find the area of the disc. Give your answer correct to the nearest cm^2 .

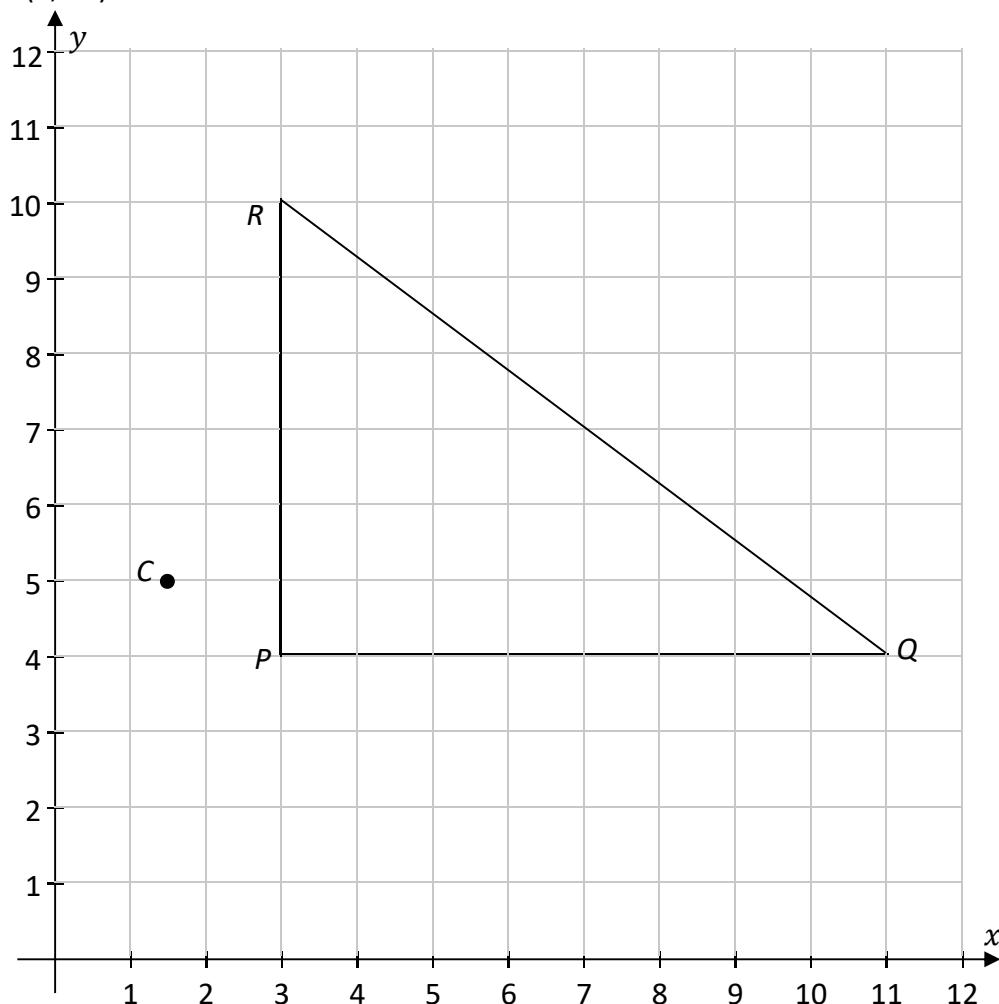
- (iii) Write the area of the disc as a percentage of the total area of the square.

Section B**100 marks**

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

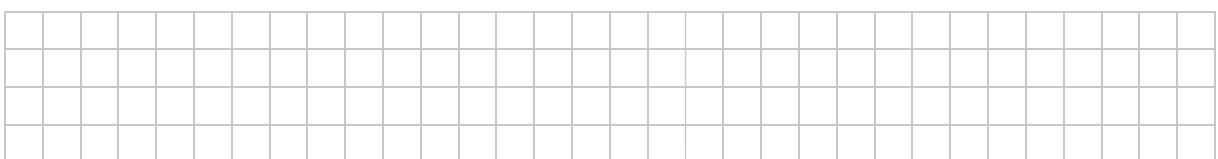
Question 9**(50 marks)**

- (a) The triangle PQR is shown in the diagram below, where $P = (3, 4)$, $Q = (11, 4)$, and $R = (3, 10)$.



- (i) Draw the triangle ABC on the same diagram, where $A = (1.5, 2)$, $B = (5.5, 2)$, and $C = (1.5, 5)$.

Note: the point C is already marked in for you.



- (ii) The triangle PQR is the image of the triangle ABC by an enlargement of scale factor k and using $(0, 0)$ as the centre of the enlargement.
Use the lengths of $[PR]$ and $[AC]$ to find k , the scale factor of the enlargement.

$ PR =$	
$ AC =$	
$k =$	

- (iii) The triangle PQR has a right angle at P .
Use the Theorem of Pythagoras to find the length of $[QR]$.

- (iv) Use your answers to part (a)(ii) and part (a)(iii) to find the length of $[BC]$.

- (v) The area of the triangle ABC is 6 square units.
Using this, or otherwise, find the area of the triangle PQR .

This question continues on the next page

- (b) Frankie had to do the following calculation.

$$\begin{array}{r} 251.32 + 39.14 \\ \hline 10.3 \end{array}$$

- (i) To begin, he makes an estimate of what the answer should be.

By writing each number correct to the nearest whole number, use the boxes below to find the number that Frankie gets as his estimate.

$$\begin{array}{r} \boxed{} + \boxed{39} \\ \hline \boxed{} \end{array} = \begin{array}{r} \boxed{} \\ \hline \boxed{} \end{array} = \boxed{}$$

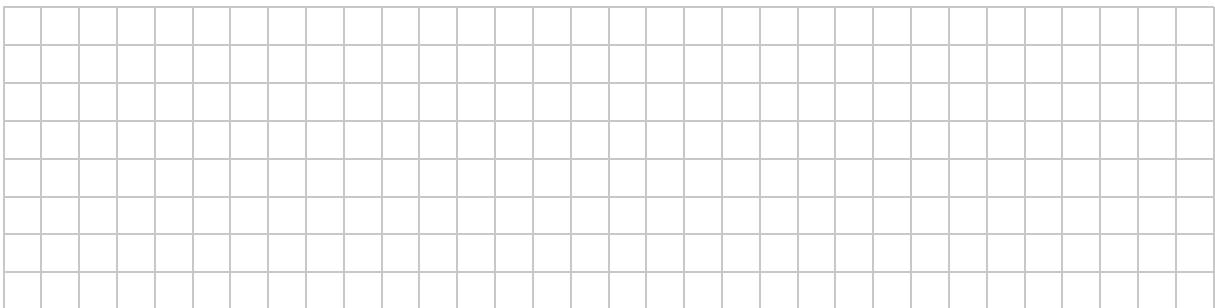
- (ii) Next Frankie uses his calculator and gets 255.12 for his answer.

Because of his estimate, he knows this answer is not correct.

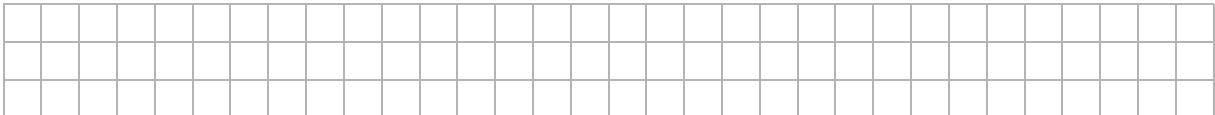
Frankie gets his incorrect answer of 255.12 by keying the following into the calculator.

$$251.32 \quad \boxed{+} \quad 39.14 \quad \boxed{\div} \quad 10.3 \quad \boxed{=} \quad 255.12$$

Explain why this does not give the correct answer to the calculation.



- (iii) Use your calculator to find the actual value of $\frac{251.32 + 39.14}{10.3}$.



Question 10**(50 marks)**

Brian had to drive from his house to Cork for a job interview.

He drove at an average speed of 80 km per hour for the first $\frac{1}{2}$ hour.

- (a) (i) Find the distance, in km, driven by Brian in the first $\frac{1}{2}$ hour.

- (ii) It then took him $1\frac{1}{2}$ hours to drive the remaining 117 km to Cork.

At what average speed, in km/h, did Brian drive the remaining 117 km?

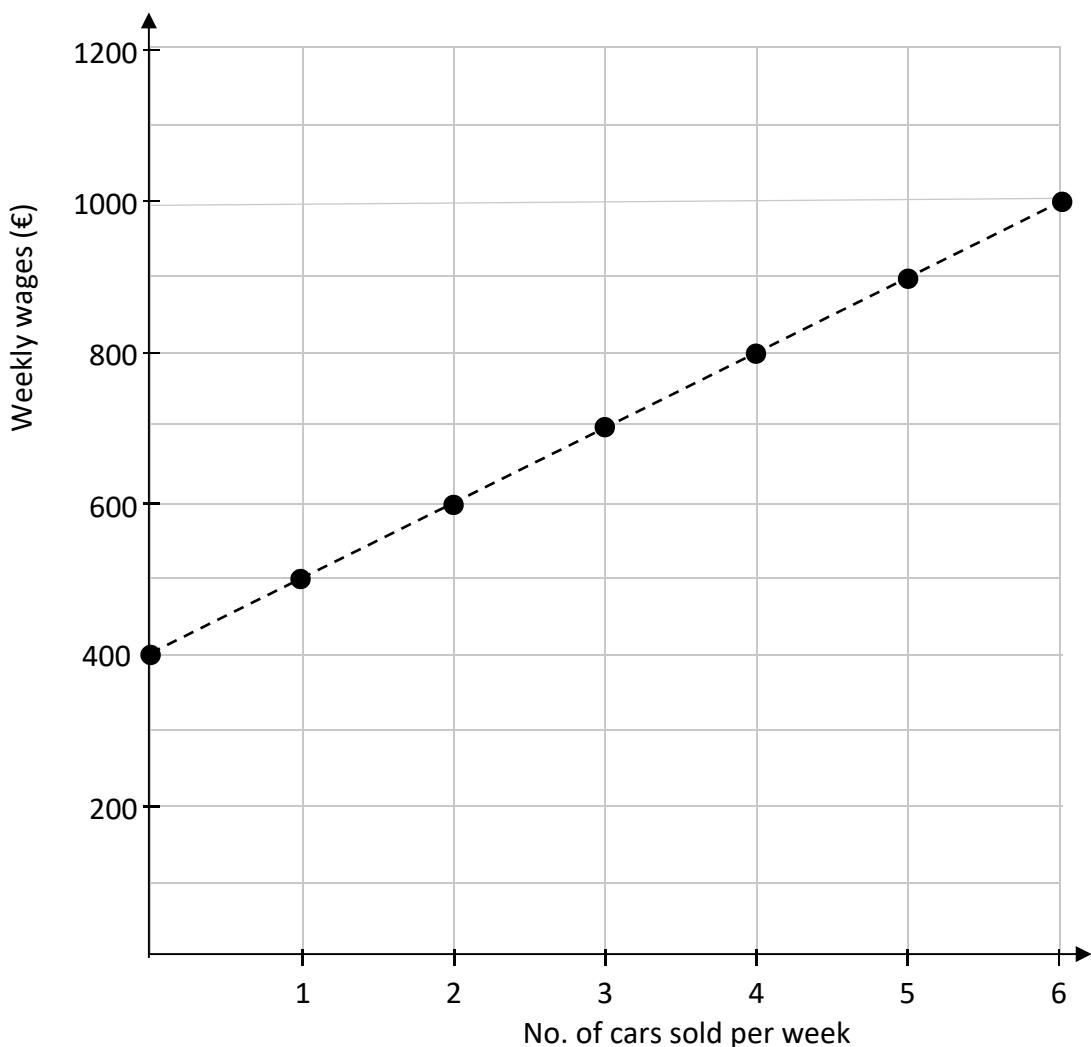
- (iii) Using the **total distance** travelled and the **total time** taken, what was Brian's average speed for the journey from his house to Cork?

This question continues on the next page

- (b)** After the interview, Brian was offered a job as a car salesperson. He could choose between 2 different contracts: Contract A and Contract B. Each contract had a basic wage and a commission for each car sold. Table 1 shows the details of each contract.

	Table 1	
	Contract A	Contract B
Basic wage per week (€)	400	600
Commission per car sold (€)	100	50

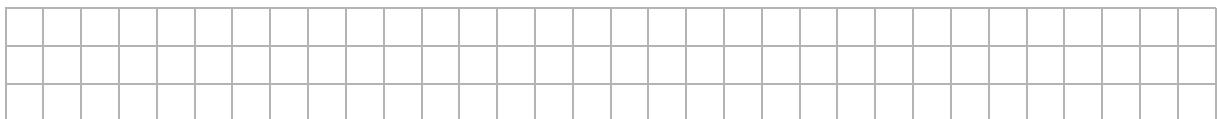
The graph on the grid below shows the total weekly wages for Contract A for up to 6 cars sold per week.



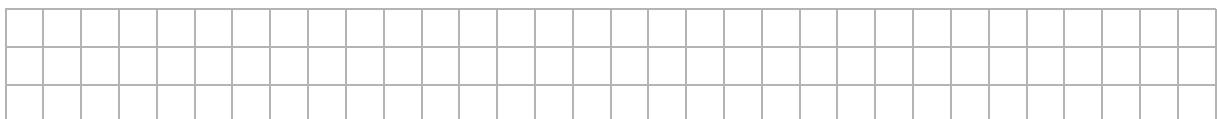
- (i) Use the graph to find Brian's total weekly wage if he were to sell 3 cars in a particular week on Contract A.

- (ii) **Table 2** below shows the total wages for Contract B for up to 6 cars sold per week.
Complete the table.

Table 2	
No. of cars sold per week	Weekly Wage (€)
0	600
1	650
2	
3	
4	
5	
6	



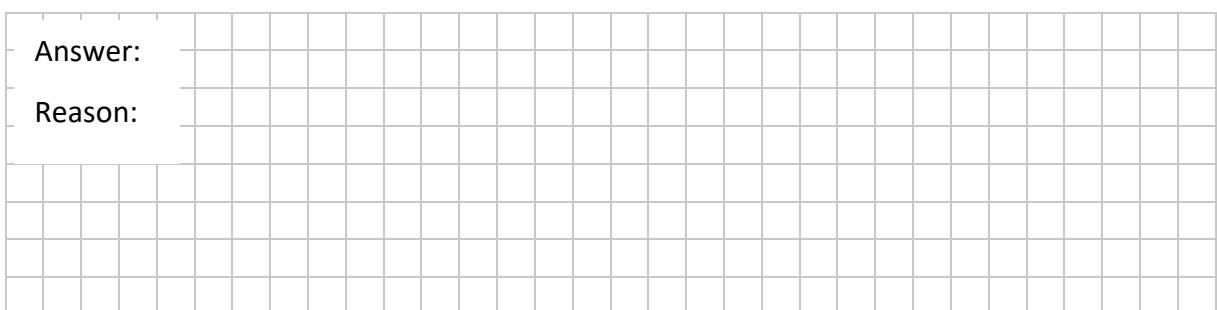
- (iii) Use the values from **Table 2** to plot the graph of the total weekly wages for Contract B on the grid on page 18.

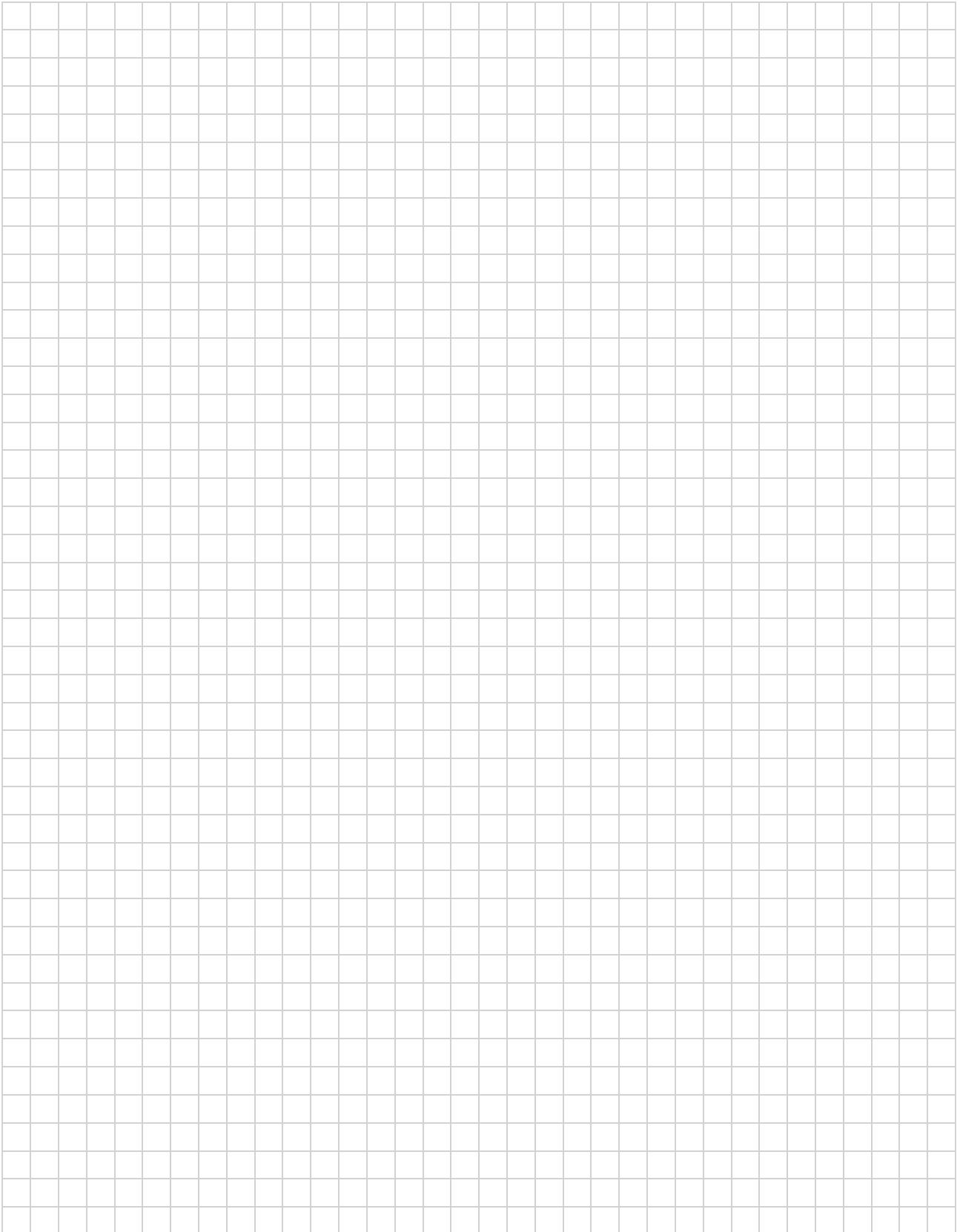


- (iv) Write down the point of intersection of the two graphs.
Explain what each number means in the context of the question.



- (v) Brian thinks he can sell an average of 5 cars per week. Which contract do you think he should choose? Give a reason for your answer.





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Mathematics

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