Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2019

Mathematics

Foundation Level

Friday 7 June – Afternoon 2:00 to 4:30

300 marks

Examination Number					

Centre Stamp

Instructions

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

Section A	200 marks	8 questions
Section B	100 marks	2 questions

Answer all ten questions.

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.

You will lose marks if your solutions do not include relevant 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:

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

Question 1 **(25 marks)**

(a) Aoife has €30. She spends $\frac{1}{2}$ of this money on magazines. Then, she spends €12·50 of what's left at the cinema.
How much money has she left after paying for the magazines and the cinema?

(b) Aoife has two brothers, Brian and Calvin.
Each of the three has their own money box.
The **total** amount of money in the three boxes is €164.
The amounts in Aoife and Brian's boxes add up to €117.

(i) How much is in Calvin's box?

(ii) Aoife has €5 more than Brian. How much does Brian have in his box?

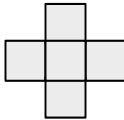**Question 2**   **(25 marks)**

(a)   A letter is chosen at random from the word '**S T A T I S T I C S**'.
          Write down the probability that the letter chosen is:

   (i)   C

   (ii)   T

(b)   A group of 120 students were asked how each travelled to school.
          Some of the results are shown in the table below.

	Car	Bus	Walk	Total
Boy	22	18	14	
Girl		23	18	66

   (i)   Complete the table.

   A student is chosen at random from the group. What is the probability that the student:

   (ii)   is a boy who walks to school

   (iii)   is a girl

   (iv)   travels to school by bus?

Question 3 **(25 marks)**

The diagram below shows the first 3 patterns in a sequence of patterns of squares.

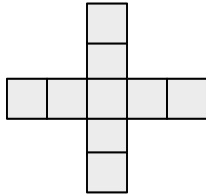**(a)** Draw pattern 4 of the sequence in the space below.
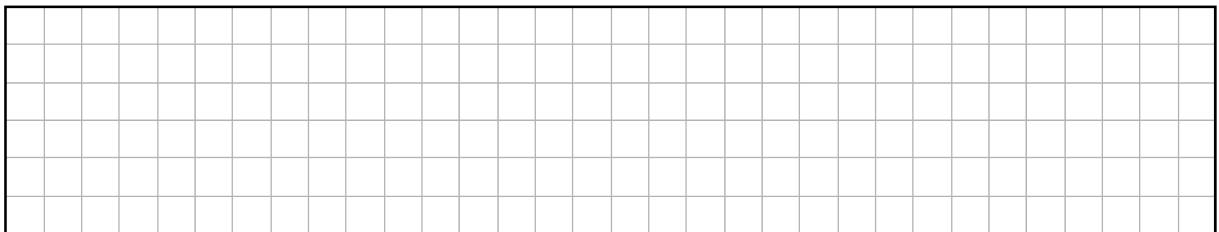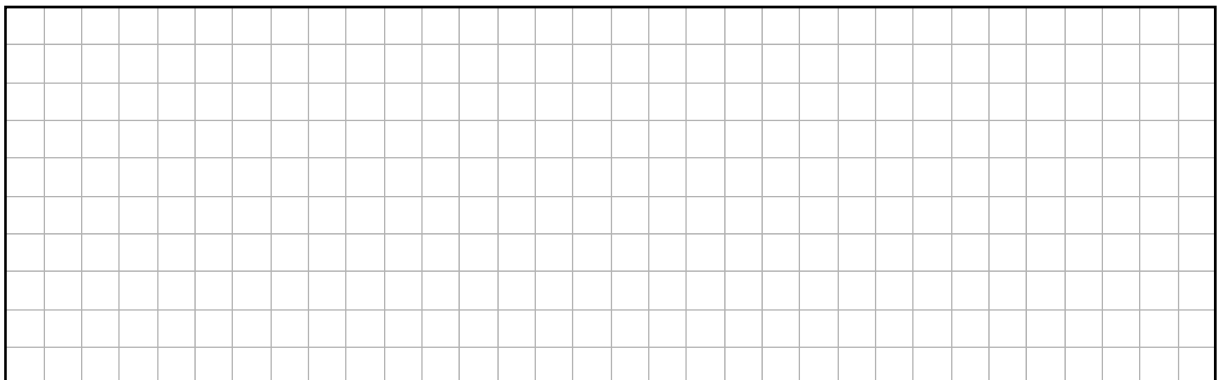
Pattern 1   **Pattern 2**   **Pattern 3**   **Pattern 4**

(b) Complete the table below:

	Number of Squares
Pattern 1	1
Pattern 2	5
Pattern 3	
Pattern 4	
Pattern 5	
Pattern 6	

(c) How many squares are there in pattern 9?

**(d)** Which pattern has 101 squares?

Question 4 **(25 marks)**

(a) John and Mary divided €150 between them in the ratio 3 : 2. Find how much each got.

(b) Lena bought a rug for €20 and later sold it for €26.
Write her profit as a percentage (%) of the cost price.

(c) In a league, a team gets 5 points for a win, 2 points for a draw and 0 points for a defeat.
Alexander's team has played 17 games and have 50 points.
5 of the games his team played were draws.
How many games did his team lose?
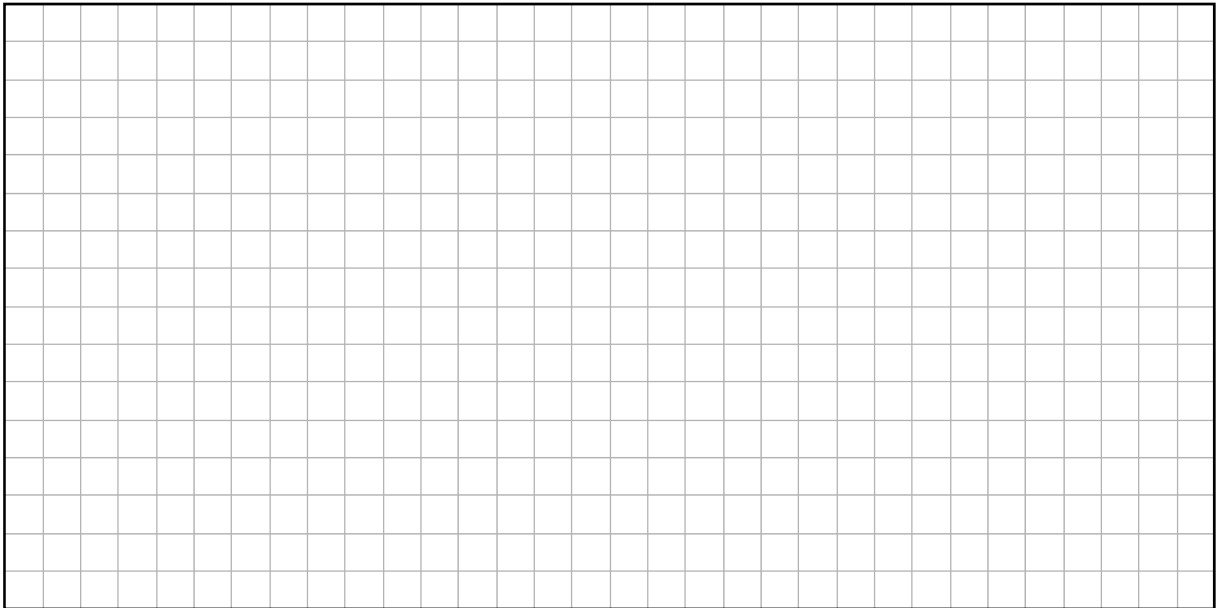
Question 5   (25 marks)

Maia is travelling from Galway to Belfast by bus. The bus leaves Galway at 12:30. It makes two stops on the journey. The first stop is in Athlone (A). Later, the bus stops in Monaghan before continuing on to Belfast. The graph below shows Maia's journey.
Use the graph to answer the following questions.
In each of the parts **(a)** to **(d)** show relevant work on the graph.
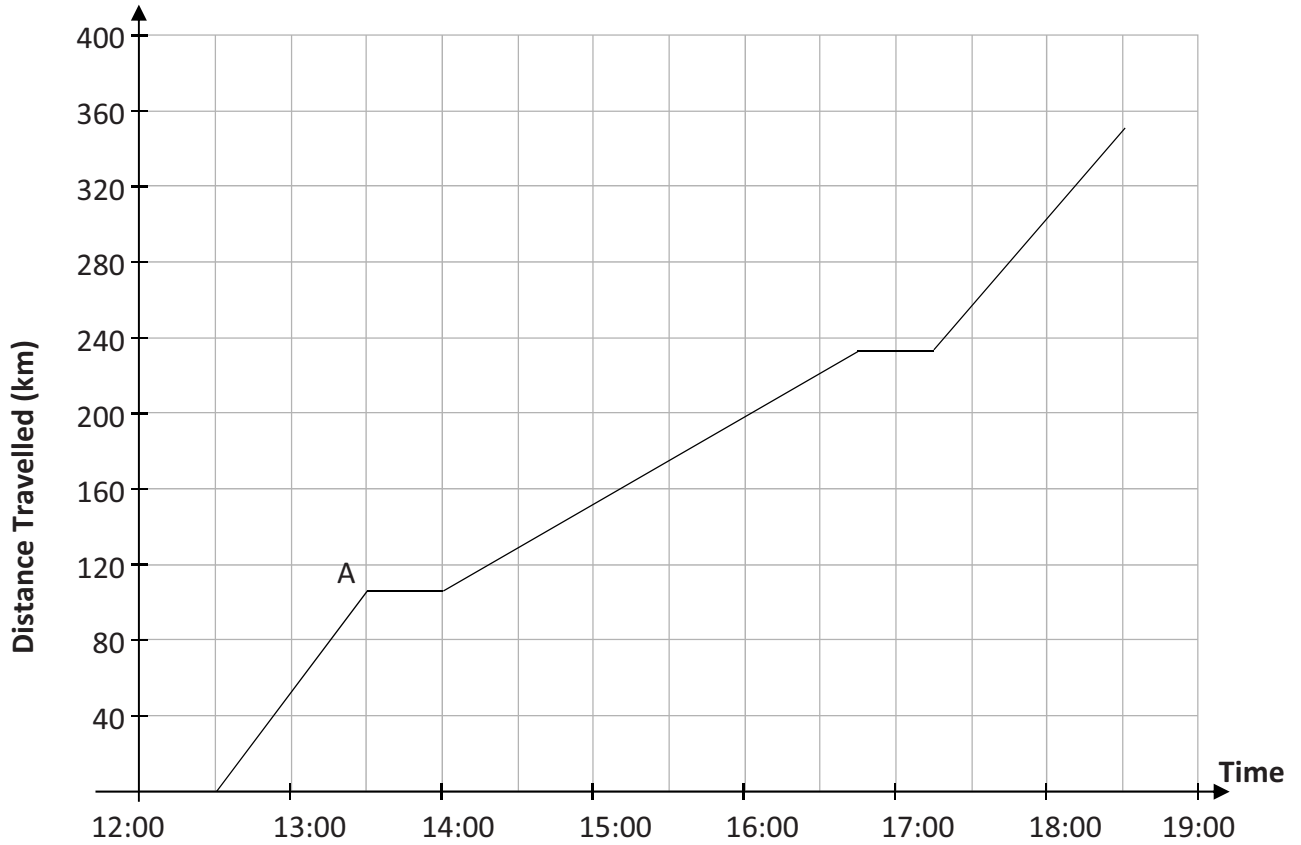
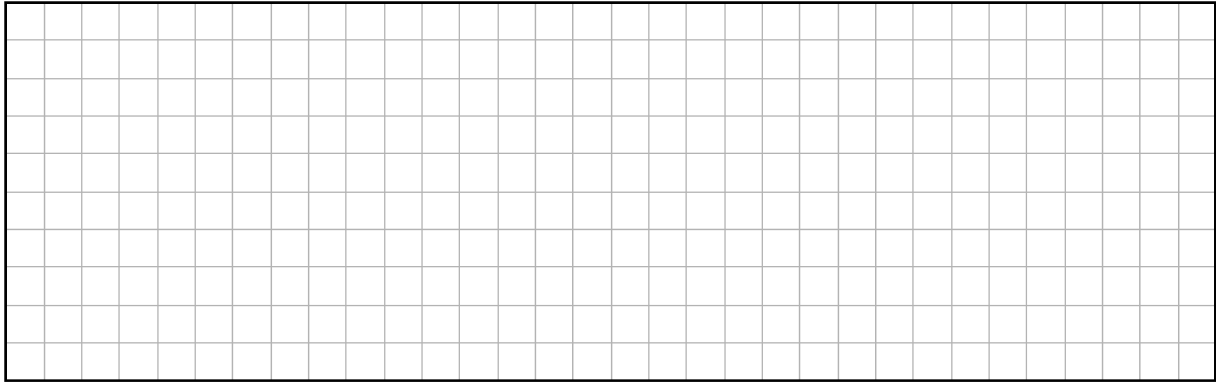**(a)** How long did it take the bus to get to Athlone (A), the first stop?

(b) At what time did the bus arrive in Monaghan, the second stop?
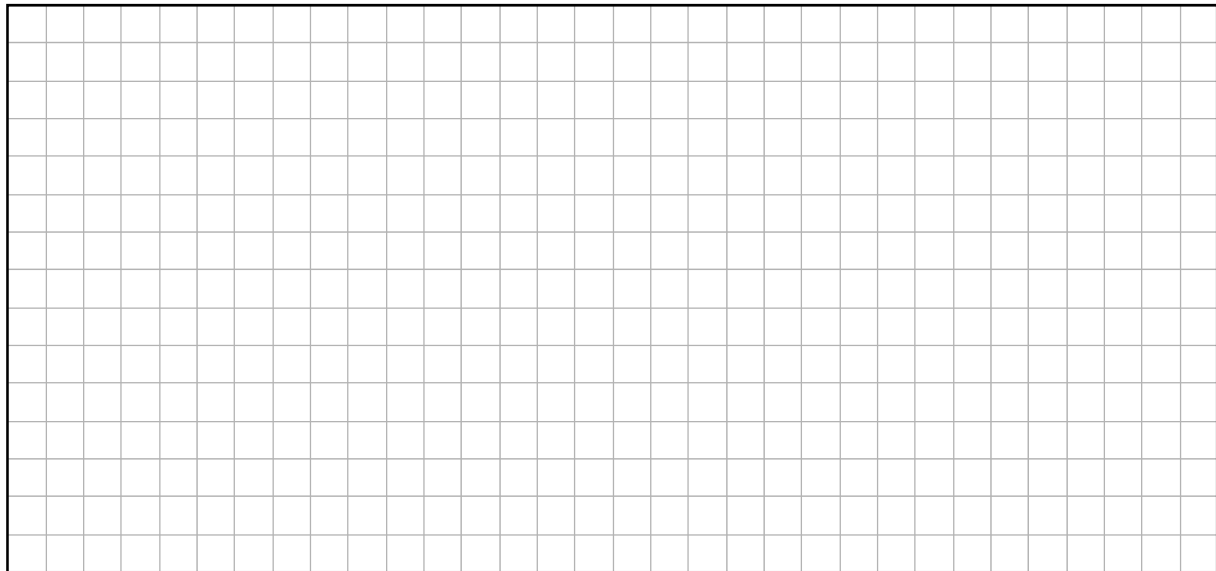
(c) For how long did the bus stop in Monaghan?

**(d)** Estimate the distance the bus travelled from Monaghan to Belfast.

(e) Use the total distance the bus travelled from Galway to Belfast and the total time it took the bus to travel from Galway to Belfast, to calculate the average speed for the journey.
Give your answer correct to the nearest km/h.

Question 6 **(25 marks)**

(a) Use the Theorem of Pythagoras to find the value of *x* in the diagram below.
Give your answer correct to the nearest cm.

90 cm

x

L

200 cm
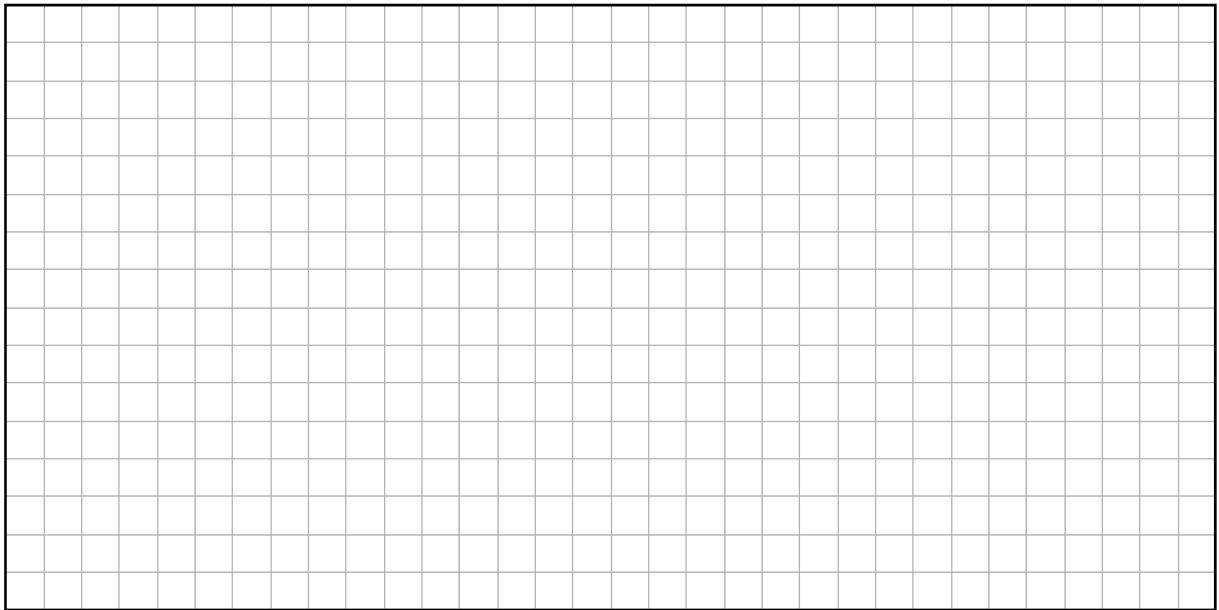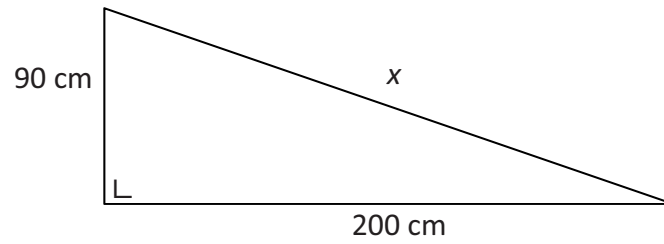
(b) Which of the following fractions is nearest in value to $\frac{1}{2}$? Give a reason for your answer.

$$\frac{3}{5} \qquad \frac{7}{10} \qquad \frac{11}{20}$$

Answer:

Reason:

(c) Janice runs an online business using different currencies.
One transaction costs her 2 500 000 Chilean Pesos.
On that day 1 Chilean Peso was worth 0·0013 Euro.
What was the cost of this transaction in euro?

Question 7 **(25 marks)**

In his Science class, Eoin took readings to show how the extra length in a spring depends on the mass (weight) hanging from it. His results are given in the table below.

Mass (g)	Extra length (cm)
0	0
20	3
40	6
60	9
80	12
100	15

Next Eoin plotted the 6 points from his table and joined them with a straight line.

(a) Complete the graph on the grid below to show Eoin's points and his line.
(One point has been plotted for you.)
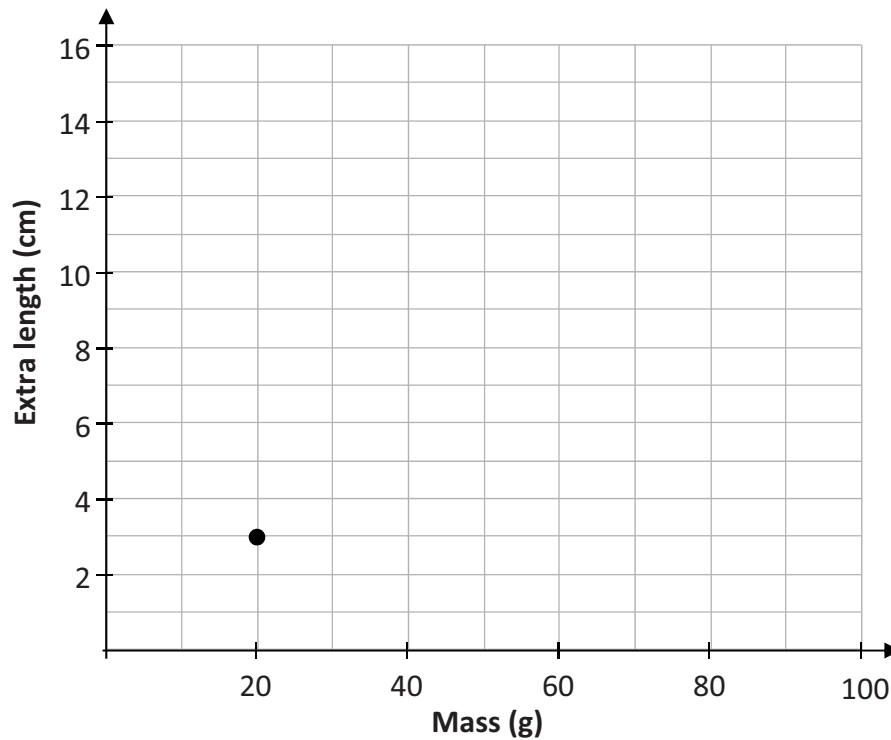
(b) Eoin then hung a mass of 50 g from the spring.
Use the graph above to estimate the extra length in the spring.

(c) Eoin hung a single new mass from the spring and he found that the extra length was 10 cm.
Use the graph above to estimate the mass he hung from the spring.

Question 8 **(25 marks)**

(a) The rectangular box shown below has a square base of length 10 cm and is 6·5 cm high.
Find the volume of the box.
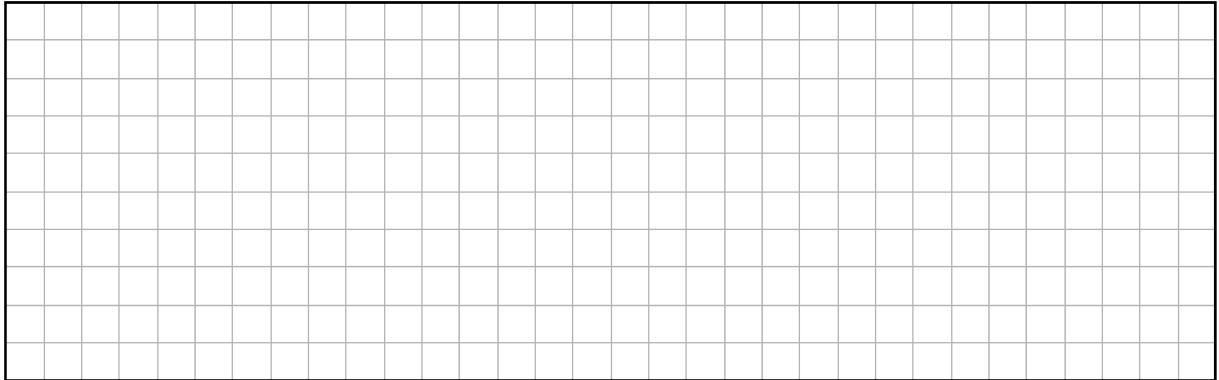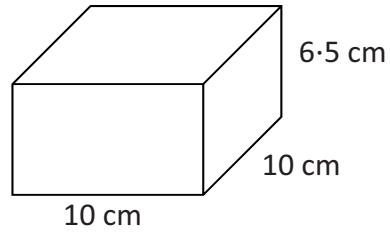
(b) The diagram below (not drawn to scale) shows Tom's lawn, with measurements as shown.
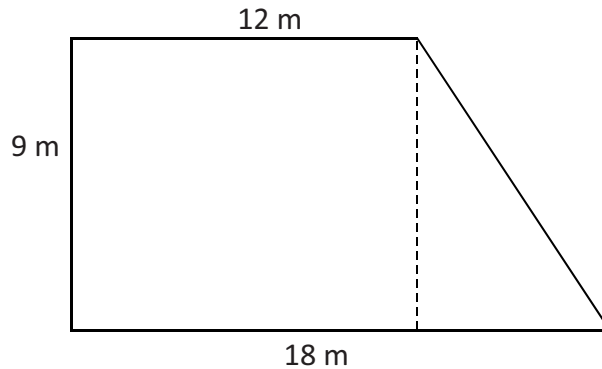
(i) The lawn can be divided into a rectangle and triangle (as shown by the dotted line in the diagram). Find, in m², the area of the lawn.
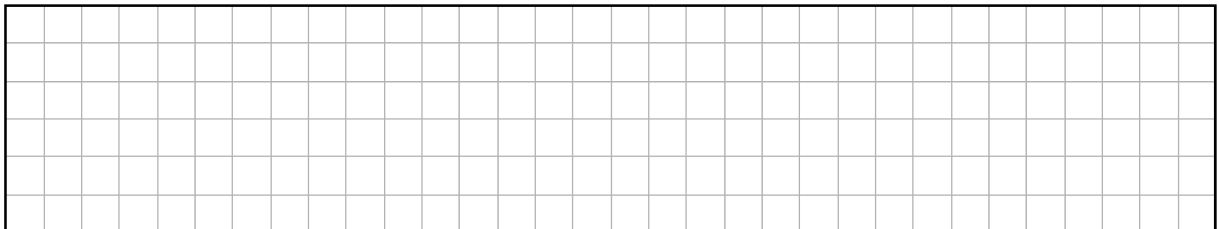
(ii) Tom wants to reseed his lawn. A bag of grass seed covers 20 m².
What is the minimum number of bags he will need to reseed the whole lawn?

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

Question 9   **(45 marks)**

The diagram on the right shows a drawing of the logo
of a company *Little and Large*.
It consists of a line and two circles enclosed in a
rectangle.
The length of the rectangle is 12 cm.
The diameter of circle *s* is 8 cm.

(a) Find the area of the rectangle, in cm^2.

(b) Find the area of circle *s*. Give your answer correct to the nearest cm^2.

(c) The area of circle *t* is $\frac{1}{4}$ of the area of circle *s*.
Find the area of the shaded region in the diagram.

(d) Construct a full-sized version of the logo (12 cm × 8 cm rectangle, 2 circles and a line) in the box below. (The shading is not necessary.)

Question 10 (55 marks)

Students in a Maths class were asked to collect and represent data, for a project on statistics.

(a) Emily collected data on the shoe sizes of 28 male students.
This data is shown in the table below:

Shoe Size	4	5	6	7	8	9
Number of Students	1	3	8	9	5	2

(i) Draw a **bar chart** on the grid below to represent the data.

(ii) What is the mode of the shoe size data.

(b) Jason collected data on the favourite sports of a group of boys.
The results are shown in the pie chart below.

(i) Find the value of x, the missing angle. Show all your work.

(ii) There are 30 boys in total in the group.
Find the number of boys who said that rugby was their favourite sport.

This question continues on the next page.

(c) Rachel collected data on the heights, to the nearest cm, of 21 female students from a particular class. Her results are shown below.

160	172	157	163	167	174	150
168	162	158	172	156	167	147
153	149	157	161	170	159	162

(i) Complete the stem and leaf plot below to display the data.

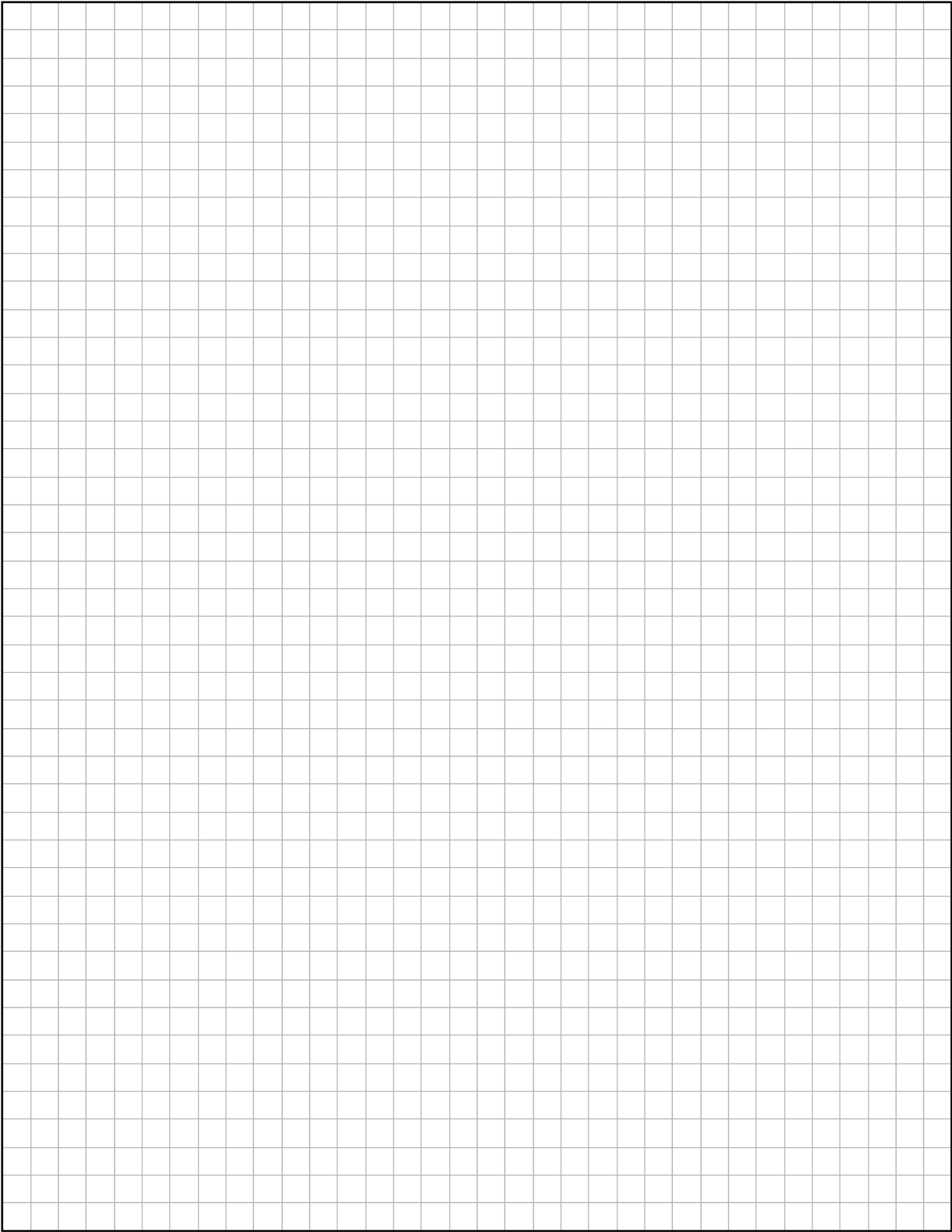| 14									
15									
16									
17									

Key: 15|6 = 156 cm

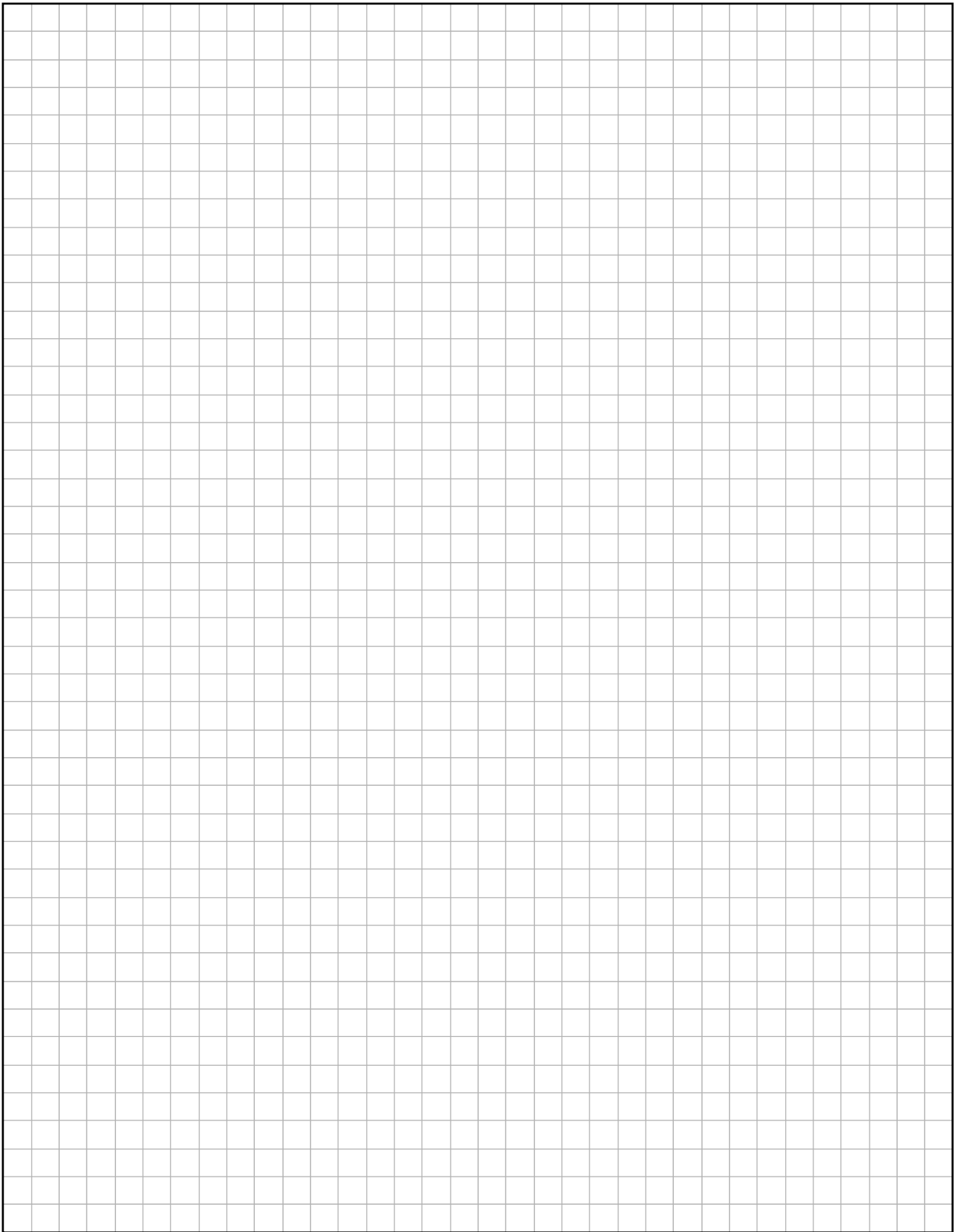**(ii)** What was the median height of the students?

(iii) What was the range of the data?

You may use this page for extra work.
Label any extra work clearly with the question number and part.

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