

<b>Surname</b>	
<b>Other names</b>	

# Mathematics

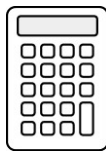
# Unit 1H

## Unit 1 Higher Tier

## Practice Paper for GCSE

### For this paper you must have:

- a calculator
- mathematical instruments.



### Time allowed

- 1 hour

### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this booklet. Cross through any work that you do not want to be marked.

### Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 54.
- Quality of written communication is specifically assessed in questions 8 and 12. You will be marked on your ability to:
  - use correct and accurate mathematical notation and vocabulary
  - organise your work clearly.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

### Advice

- In all calculations, show clearly how you work out your answer.

This paper is intended for practice only. Pearson Education does not guarantee that the style or content of this paper matches the public examination.

**1** A coin is spun 60 times.  
Heads appears 41 times.

**(a)** The coin is spun once more.  
Write down the probability of the coin landing on heads if:

**(i)** the coin is fair

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*(1 mark)*

**(ii)** the coin is biased

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*(1 mark)*

**(b)** Which of the answers to part **(a)** is an estimate?  
Tick **one** box.

The first       The second       Both

Give a reason for your answer.

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*(2 marks)*

2 Here is an advert for a holiday.

**Happyhols – Bargain deals**

Dates	7 nights	10 nights	14 nights
1 May–30 June	£240	£320	£415
1 July–31 August	£295	£365	£445

- \* Prices are for one adult (16 years and over)
- \* Children (less than 16 years) 60% of adult price
- \* 15% discount if booked online ([www.happyhols.co.uk](http://www.happyhols.co.uk))

Fran books a 7-night holiday in May.  
 She books it for herself, her husband Ron and their daughter Amy (12 years).  
 She books it at a travel agent's shop.  
 The travel agent charges a small percentage booking fee.  
 The total cost, including the booking fee, is £639.60.  
 What is the percentage booking fee?

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(4 marks)

3 Last season Blackchester Town won  $\frac{7}{15}$  of their games and drew  $\frac{2}{5}$  of their games.  
 They lost 4 games.  
 A win scores 3 points, a draw scores 1 point and a loss scores no points.  
 Teams qualifying for the Inter-City cup scored over 52 points.  
 Did Blackchester Town qualify for the Inter-City cup?

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(6 marks)

**4** Sixteen people were asked how many driving lessons they had before passing their driving test.  
 The results of the survey were  
 22 15 9 16 29 38 18 19  
 48 18 58 21 15 22 23 13

**(a)** Complete an ordered stem and leaf diagram to represent this data.  
 Remember to complete the key.

0		Key
1		...   ... represents ..... lessons
2		
3		
4		
5		

0		Key
1		...   ... represents ..... lessons
2		
3		
4		
5		

*(3 marks)*

**(b)** Tony says,  
 'The mean of these numbers is 24, so the average number of lessons needed to pass a driving test is 24'.

Is this a reasonable statement to make?  
 Give a reason for your answer.

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*(2 marks)*

**5** The table shows the distances that 100 people travelled to work each day.

Distance, $d$ (km)	Frequency		
$0 < d \leq 4$	14		
$4 < d \leq 8$	23		
$8 < d \leq 12$	33		
$12 < d \leq 16$	20		
$16 < d \leq 20$	10		

Calculate an estimate of the mean distance travelled.

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(4 marks)

**6** In a school, the probability that a boy is left-handed is 0.2.  
 The probability that a girl is left-handed is 0.3.  
 The school has 480 boys and 520 girls.  
 Estimate the probability that a student, picked at random, is left-handed.

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(4 marks)

7

People in a village are worried that a new motorway will be built nearby and will destroy much of the wildlife of the area.

They are surveying local opinion and this is one of the questions on their questionnaire.

The new motorway will destroy a lot of the wildlife of the area. Don't you agree?		
Agree	<input type="checkbox"/>	Strongly agree <input type="checkbox"/> Don't know <input type="checkbox"/>

(a) Give **two** criticisms of the question.

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(2 marks)

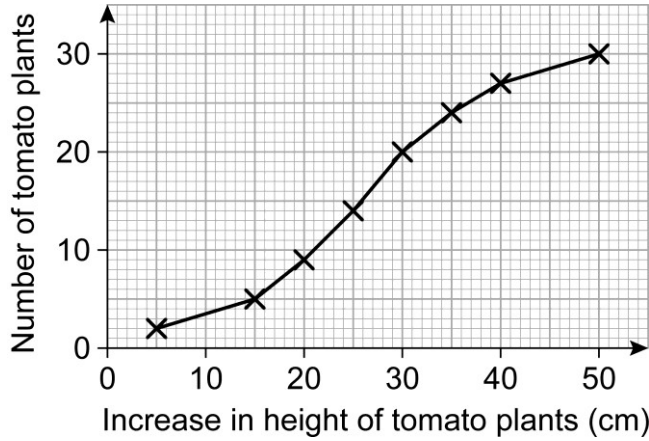
(b) Rewrite the question to make it more suitable.

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(2 marks)

8\*

Grace bought 60 tomato plants and split them into two identical batches of 30 plants. One batch of 30 plants was planted and allowed to grow naturally. Grace measured the increase in their heights six weeks later. The results for the **first** batch are shown on this cumulative frequency graph.

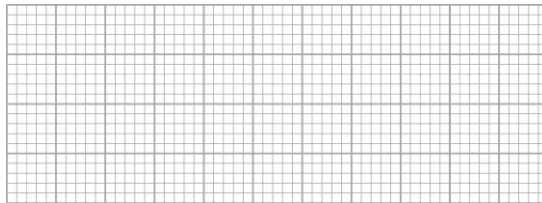


- (a) How many of these tomato plants had increased in height by more than 31 cm?

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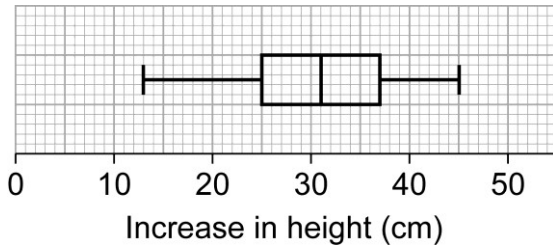
(1 mark)

- (b) On the graph paper below, draw a box plot from the cumulative frequency diagram for the **first** batch of tomato plants.



(3 marks)

The **second** batch of 30 tomato plants was planted and treated with *Growfast* to help the plants grow bigger and stronger.  
 This box plot shows the results when Grace measured the increase in their heights six weeks later.



(c) Do you think that the use of '*Growfast*' was justified?

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(3 marks)

9 There are 600 members in a golf club.  
 A stratified sample is taken, by age.  
 The table shows some information about the age grouping of the members.

<b>Age (years)</b>	13–24	25–44	45–64	65+
<b>Number of members</b>	100			120
<b>Number in sample</b>	20		35	

Complete the table.

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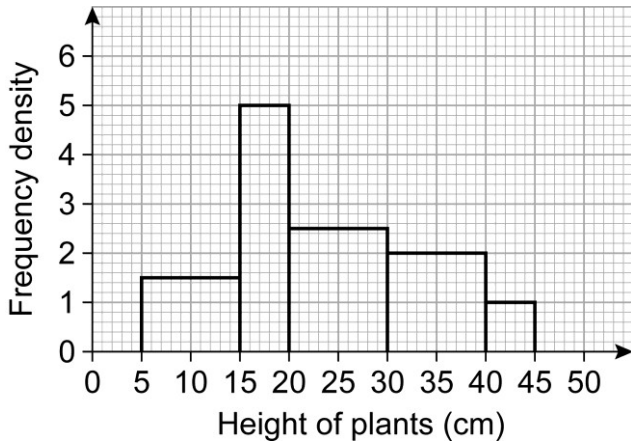
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(4 marks)

**10** The histogram represents the heights of plants, in centimetres, at a garden centre.



**(a)** How many plants are represented by the histogram?

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*(2 marks)*

**(b)** Estimate the median height of the plants.

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*(2 marks)*

**11** Population density is the average number of people per square kilometre.  
 The population of Spain is 46.7 million, correct to one decimal place.  
 The area of Spain is 505 000 square kilometres, correct to three significant figures.  
 Calculate the maximum population density in Spain.  
 You **must** show your working.

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*(3 marks)*

**12\***

At the end of a training course those on the course must take a test.  
On average, 80% of them pass the test at the first attempt.  
Those who fail are allowed to re-sit.  
On average, 60% of those re-sitting pass the re-sit.  
No further attempts are allowed.  
Dave and Ellie are both due to start on the training course.  
They want to know the chance of them both passing the test at the end of the course.  
Estimate the probability that they both pass.

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*(5 marks)*