



Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

I declare this is my own work.

**Level 3 Certificate
MATHEMATICAL STUDIES**

Paper 1

1350/1

Time allowed: 1 hour 30 minutes

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]



J U N 2 2 1 3 5 0 1 0 1

For this paper you must have:

- **a clean copy of the Preliminary Material and Formulae Sheet (enclosed)**
- **a scientific calculator or a graphics calculator**
- **a ruler.**

INSTRUCTIONS

- **Use black ink or black ball-point pen. Pencil should only be used for drawing.**
- **Answer ALL questions.**
- **You must answer each question in the space provided. Do not write on blank pages.**
- **If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).**
- **Show all necessary working; otherwise, marks for method may be lost.**



- **Do all rough work in this book. Cross through any work you do not want to be marked.**
- **The FINAL answer to questions should be given to an appropriate degree of accuracy.**
- **You may NOT refer to the copy of the Preliminary Material that was available prior to this examination. A clean copy is enclosed for your use.**

INFORMATION

- **The marks for questions are shown in brackets.**
- **The maximum mark for this paper is 60.**
- **You may ask for more answer paper or graph paper, which must be tagged securely to this answer booklet.**
- **The paper reference for this paper is 1350/1.**

DO NOT TURN OVER UNTIL TOLD TO DO SO





Answer ALL questions in the spaces provided.

1 (a) Rasheed is collecting data about cars in a car park.

Draw a line from each variable on the left to the type of data it is. [3 marks]



Qualitative and discrete

The amount of time each car is in the car park

Qualitative and continuous

The make of each car

5

Quantitative and discrete

The number of people in each car when it arrives

Quantitative and continuous

[Turn over]

- 1 (b) Rob wants to find out what students and staff think about the parking at his college.

The table shows information about the students and staff.

	Students aged 16 to 18	Students aged 19+	Staff
Male	345	129	56
Female	406	162	42

Rob decides to take a stratified sample of 80 from these groups of students and staff.

Work out the number of **MALE STUDENTS AGED 19+** that should be in the sample.
[2 marks]



Answer _____

5

[Turn over]



2 Peter took out a mortgage for £150 000 at the end of December 2021

The ANNUAL interest is 3.6%, charged MONTHLY.

His monthly payment is £920

At the end of each month, the interest is added then the payment is deducted.

The spreadsheet shows some information about the amount he still owes at the end of each month.



▲	A	B
1	Month	Balance
2	Initial borrowing	150 000.00
3	January	149 530.00
4	February	149 058.59
5	March	
6	April	
7	May	147 635.86
8	June	147 158.77

[Turn over]



2 (a) Complete the spreadsheet.

Give each value to the nearest penny. [2 marks]

2 (b) Work out the total amount of interest that Peter pays in the first six months. [3 marks]

Answer £ _____

[Turn over]



- 2 (c) Peter wants to know what percentage of his original mortgage he has still to pay after these six months.

Circle the spreadsheet formula he can use to work this out.
[1 mark]

$$=(B2 - B8)/B$$

$$=(B2 - B8)/B8$$

$$=B2/B8*100$$

$$=B8/B2*100$$



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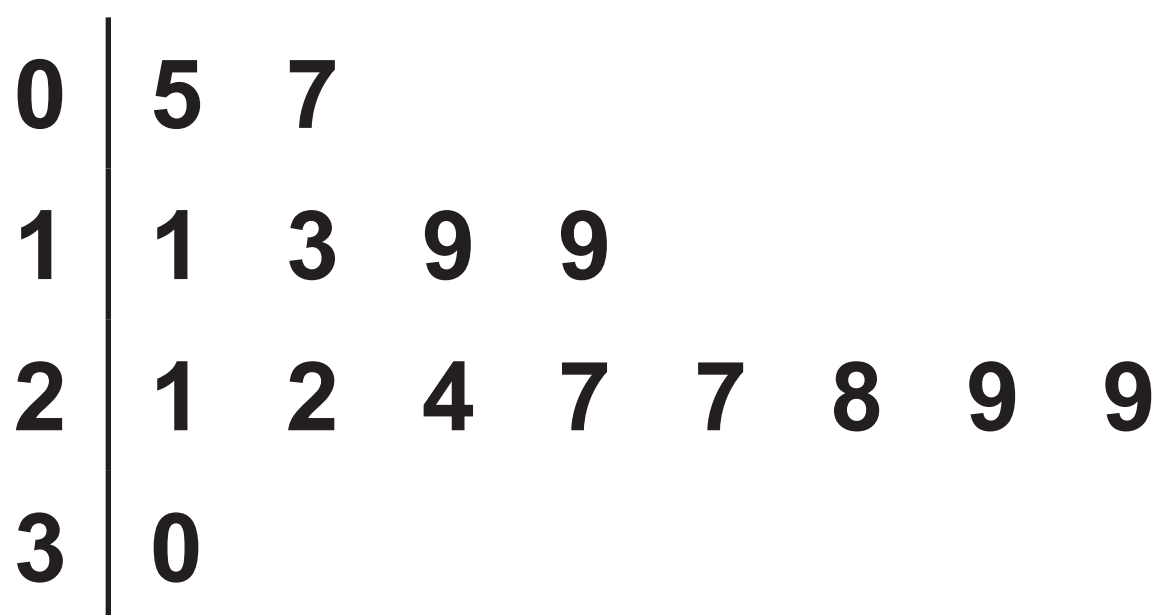
3 15 students sat a Maths exam and an English exam.

Both exams were marked out of 30

The stem-and-leaf diagram shows their Maths marks.

MATHS MARKS

KEY 1 | 8 represents a mark of 18



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[Turn over]



3 (a) The table shows information about their English marks.

	English marks	Maths marks
Lowest value	3	
Lower quartile	17	
Median	19	
Upper quartile	26	
Highest value	28	



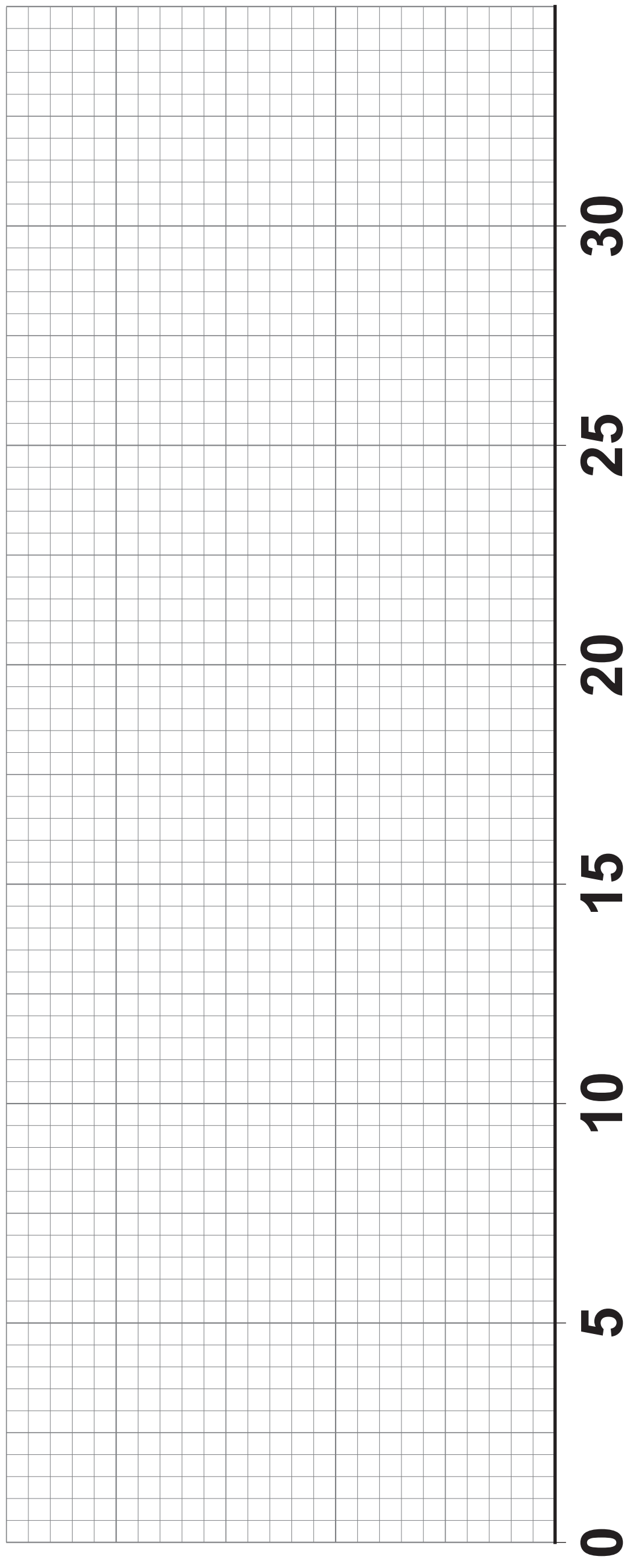
**Complete the table to show the information for the Maths exam.
[3 marks]**

[Turn over]





3 (b) Draw box and whisker plots to represent the data for the English and Maths exams. [3 marks]





3 (c) Compare the average marks for the English and Maths exams. [1 mark]

[Turn over]

3 (d) Which marks were more consistent, English or Maths?

**Give a reason for your answer.
[1 mark]**

8



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[Turn over]



4 (a) Some years ago, Kelly invested £2000 in a savings account.

Since then, she has not withdrawn money from the account but interest has been added.

The total in the account is now £2319, correct to the nearest pound.

Complete the error interval for the total amount of interest, £ I , that has been added to the account. [2 marks]

Answer _____ $\leq I \leq$



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[Turn over]



4 (b) Jessica invests an amount in a variable rate savings account.

The account receives compound interest at

2.4% per year for the first 2 years

then

3.1% per year for the next 5 years.

Jessica says,

“My investment will increase by 20.3%, because $2 \times 2.4 + 5 \times 3.1 = 20.3$ ”

By calculating the correct percentage increase, show that she is wrong. [4 marks]



5 Estimate the number of hours in a year that a washing machine is in use in an **AVERAGE household.**

State any assumptions you make.

**You MUST show your working.
[4 marks]**

Answer _____ hours

4

[Turn over]



6

Use INCOME TAX AND NATIONAL INSURANCE 2021–2022 in the Preliminary Material.

John has a gross income of £49 000 per year.

8% of his gross income is deducted and paid into his company pension.

He pays Income Tax and National Insurance, but has no further deductions.

He has the standard personal allowance.

The pension amount is deducted before Income Tax and National Insurance are calculated.

John wants to move to a new flat, which will cost £1050 per month to rent.



He says,

“I will only be able to afford the rent if it is less than $\frac{2}{5}$ of my net monthly income.”

Can John afford the rent?

You **MUST** show your working.
[8 marks]

[Turn over]





[Turn over]



[Turn over]



7 (a) Linda grows and sells potatoes.

The mean mass of her potatoes in last year's crop was 193 grams.

She sees this advert for a new fertiliser for potatoes.

New! Potato fertiliser

Increase the average mass of your crop by at least 15%

Linda uses the fertiliser on her next crop of potatoes.

The table shows the mass of these 130 potatoes when she picks them.



Mass, m grams	Number of potatoes
$120 \leq m < 160$	12
$160 \leq m < 200$	23
$200 \leq m < 240$	45
$240 \leq m < 280$	32
$280 \leq m < 320$	18

Based on these two crops of potatoes, is the claim in the advert justified?

**You MUST show your working.
[4 marks]**

[Turn over]

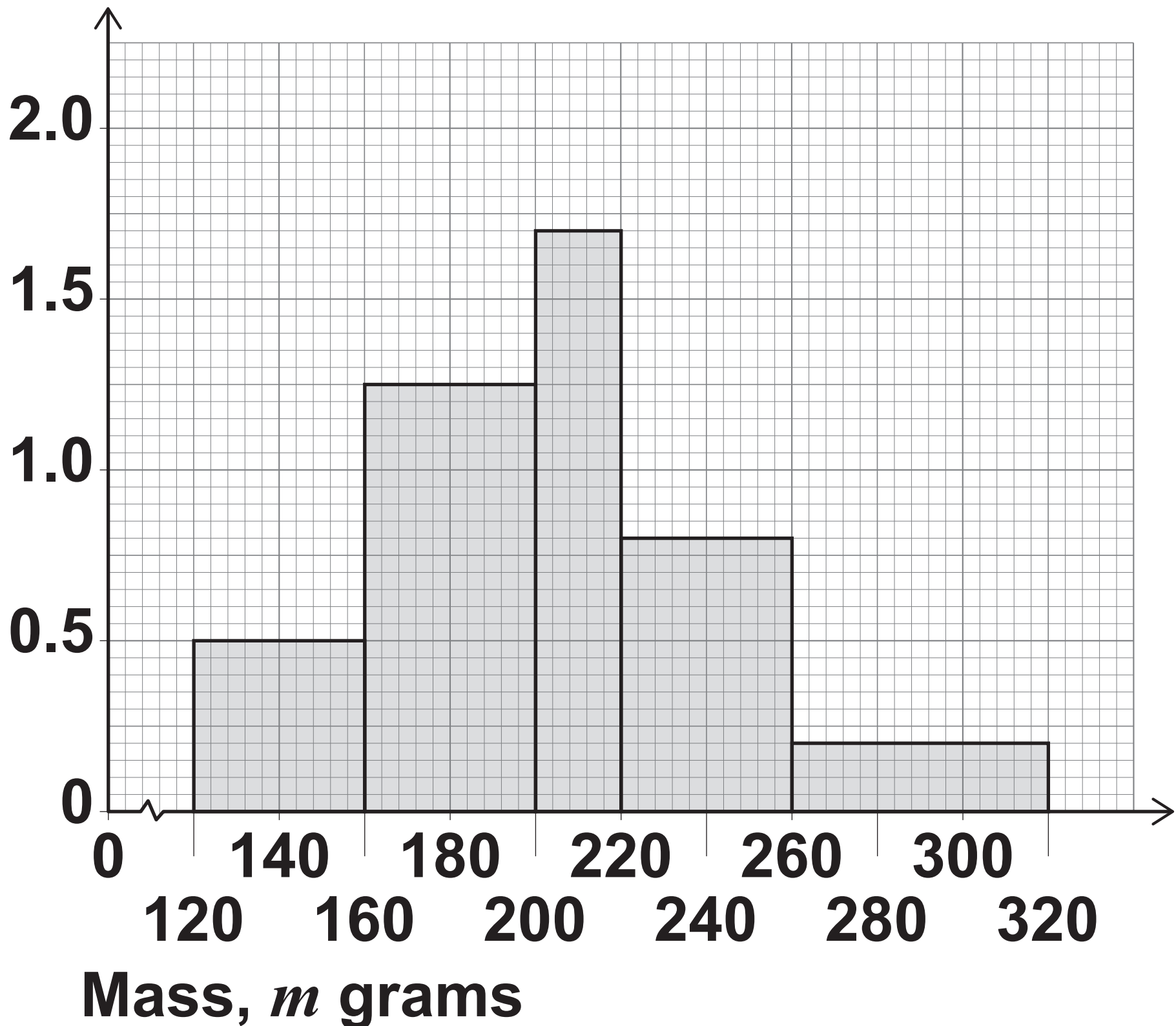




7 (b) Dan also grows and sells potatoes.

The histogram shows the distribution of the masses of his potatoes this year.

Frequency
density



[Turn over]



The potatoes are classed as small, medium and large.

Medium potatoes have a mass between 188 grams and 260 grams.

Estimate the number of Dan's potatoes that are classed as medium. [4 marks]

Answer _____

8

[Turn over]



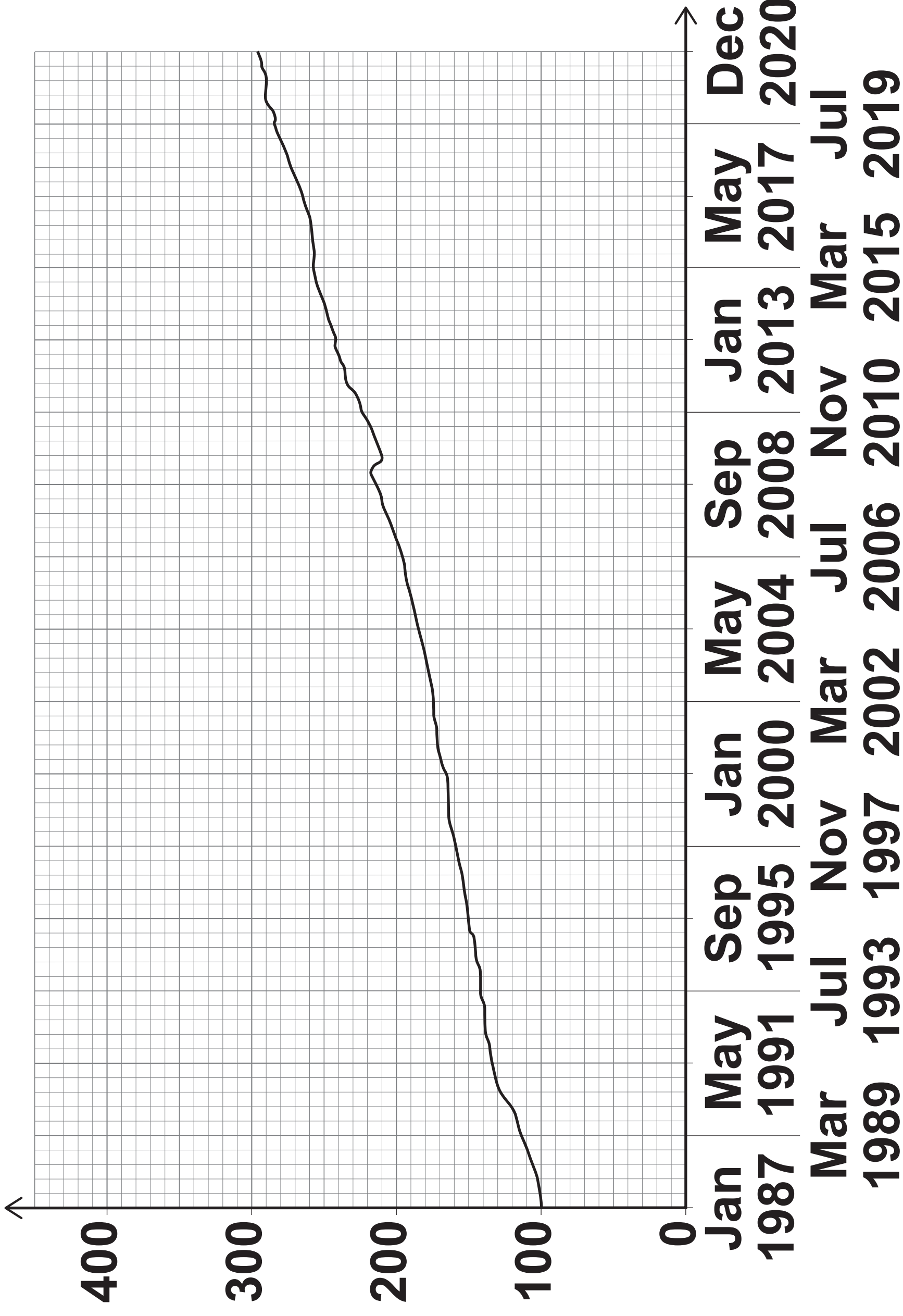


8

The chart shows information about the change in the UK Retail Price Index (RPI) between January 1987 and December 2020



Index, base year = 100



[Turn over]



8 (a) A food item cost £1.90 in January 1987

Use the chart to estimate the cost of this food item in September 1995 [3 marks]

Answer £ _____



8 (b)

An electrical item cost £129 in December 2020

**Use the chart to estimate the cost of this item
in July 2006**

You MUST show your working. [2 marks]

43

5

Answer £ _____

[Turn over]

9 (a) Use SWEET FACTORY in the Preliminary Material.

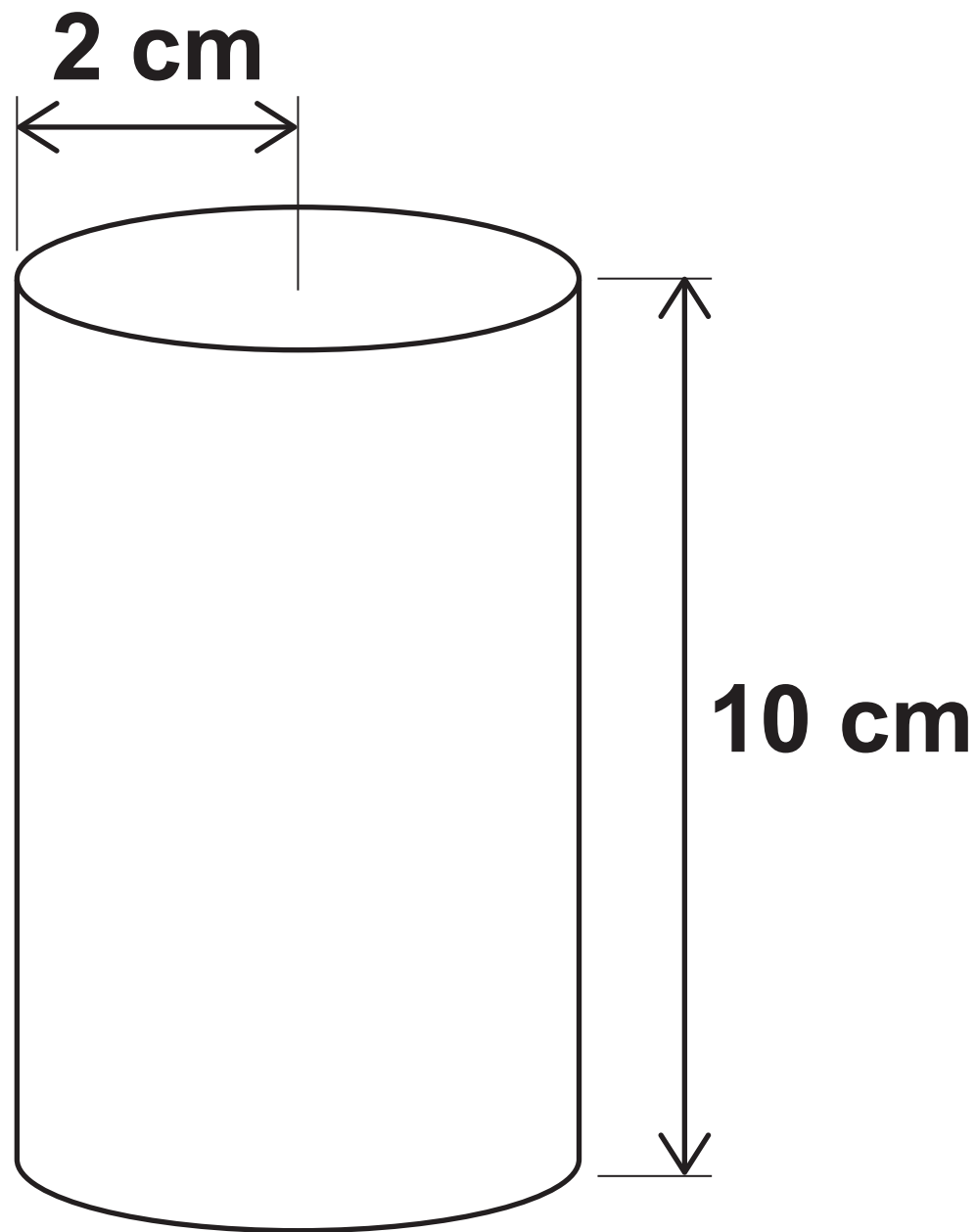
You may also use the Formulae Sheet.

The factory is making a new sweet.

The sweet will be a SPHERE of radius 0.8 cm

The sweets will be packaged into cylindrical tubes of radius 2 cm and height 10 cm





One machine will be used for these new sweets.

It will take an hour and a half before the first sweets are produced and packaged.

[Turn over]



Once the first sweets come off the production line in their tubes the production is continuous until the end of the day.

Estimate how many tubes of sweets can be filled in one working day.

Give your answer to a suitable degree of accuracy.

State any assumptions you make.

**You MUST show your working.
[9 marks]**

[Turn over]



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Answer _____

[Turn over]

9 (b) Explain HOW your answer may have been affected by one assumption you made. [1 mark]

10

END OF QUESTIONS



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Additional page, if required. Write the question numbers in the left-hand margin.

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For Examiner's Use	
Question	Mark
1	
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9	
TOTAL	

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