Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of

AQA

General Certificate of Secondary Education
Higher Tier

Mathematics 43601H

Past Paper Questions by Topic

Cumulative Frequency

H

For this paper you must have: • mathematical instruments. You must **not** use a calculator.	

Time allowed
- 1 hour 15 minutes

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 spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

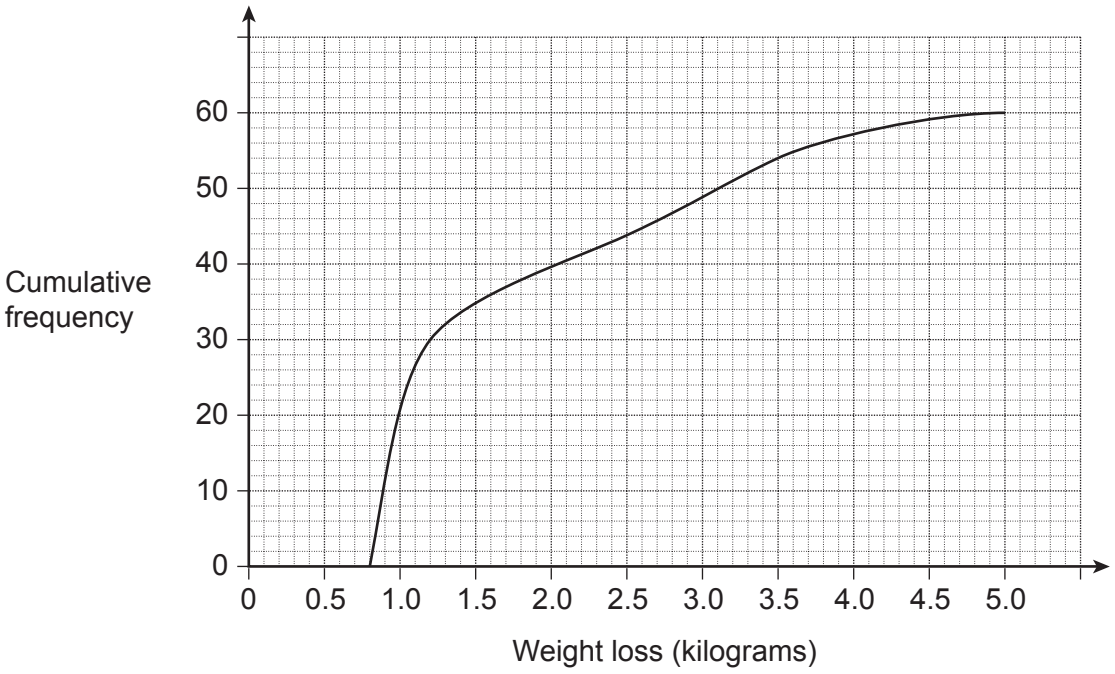
Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is.
- The quality of your written communication is specifically assessed in questions indicated with an asterisk (*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

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

By Peter Bland

***1** Two groups of people are trying to lose weight.

1 (a) Group A start running.
The graph shows information about their weight loss after one month.



1 (a) (i) How many people are in group A?

Answer ..... *(1 mark)*

1 (a) (ii) Does everyone in group A lose weight?
Write down how you decide.

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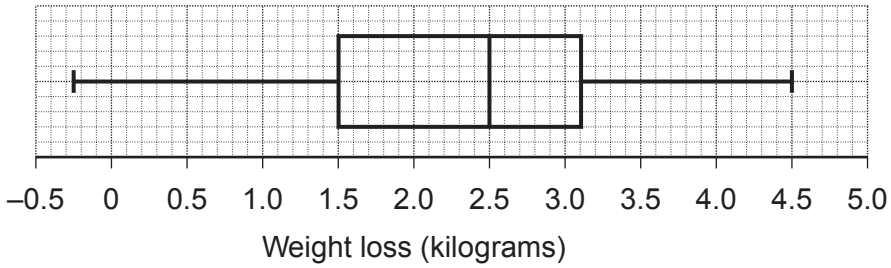
(1 mark)

1 (b) Group B start swimming.
The box plot shows information about their weight loss after one month.



Does everyone in group B lose weight?
Write down how you decide.

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(1 mark)

1 (c) Compare the weight loss of group A with group B.

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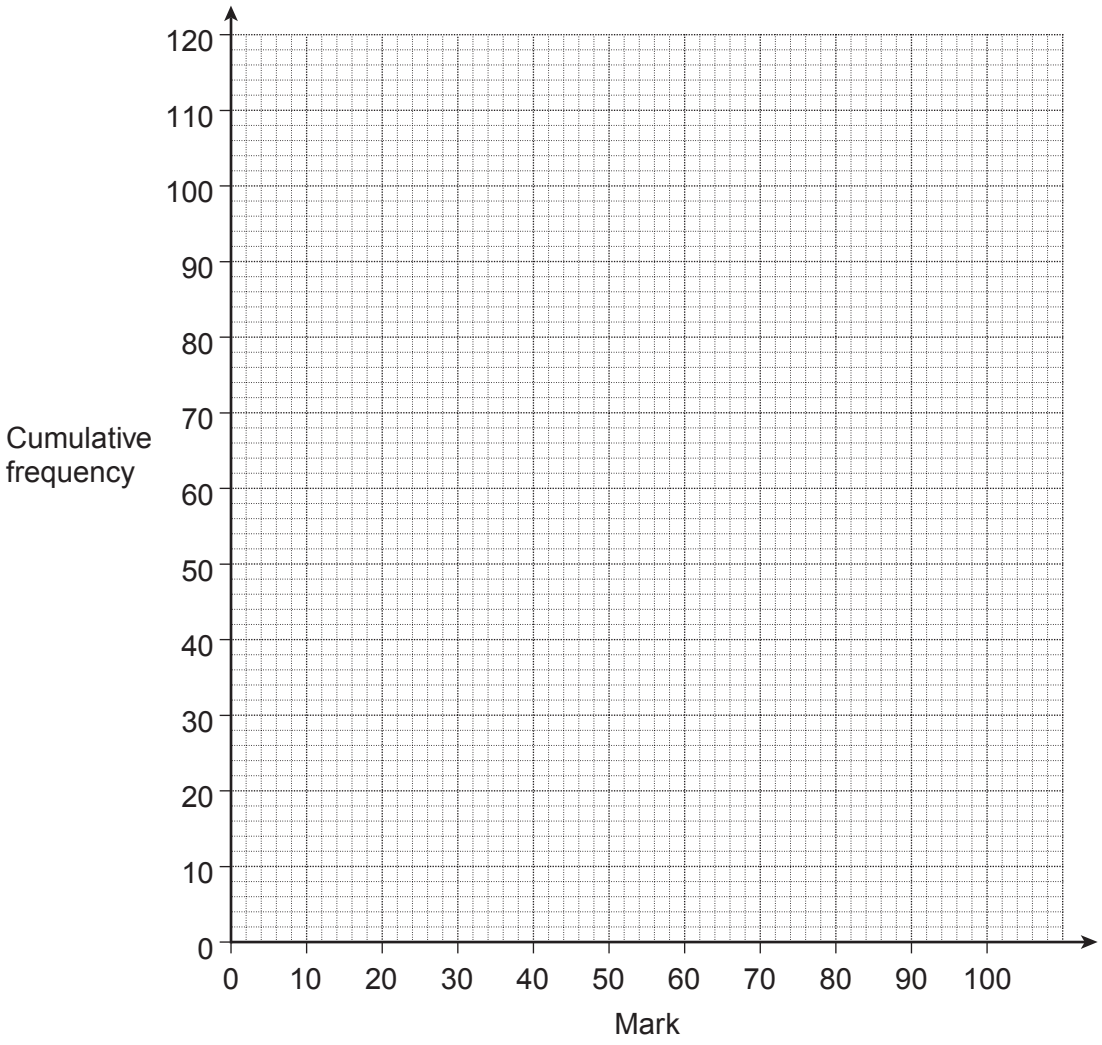
(5 marks)

2 The table shows a summary of the scores of 120 children in an examination.

Mark	Frequency
$0 < \text{mark} \leqslant 20$	8
$20 < \text{mark} \leqslant 40$	12
$40 < \text{mark} \leqslant 60$	46
$60 < \text{mark} \leqslant 80$	35
$80 < \text{mark} \leqslant 100$	19

2 (a) Three-quarters of the children pass the test.

Use a cumulative frequency graph to estimate the pass mark.



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Answer ..... *(5 marks)*

2 (b) Here is the table again.

Score	Frequency
$0 < \text{mark} \leqslant 20$	8
$20 < \text{mark} \leqslant 40$	12
$40 < \text{mark} \leqslant 60$	46
$60 < \text{mark} \leqslant 80$	35
$80 < \text{mark} \leqslant 100$	19

Two of these 120 children are chosen at random.

2(b) (i) Work out the probability that both scored **over** 60.

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Answer ..... *(2 marks)*

2(b) (ii) Work out the probability that one scored **over** 80 and the other scored 80 or **under**.

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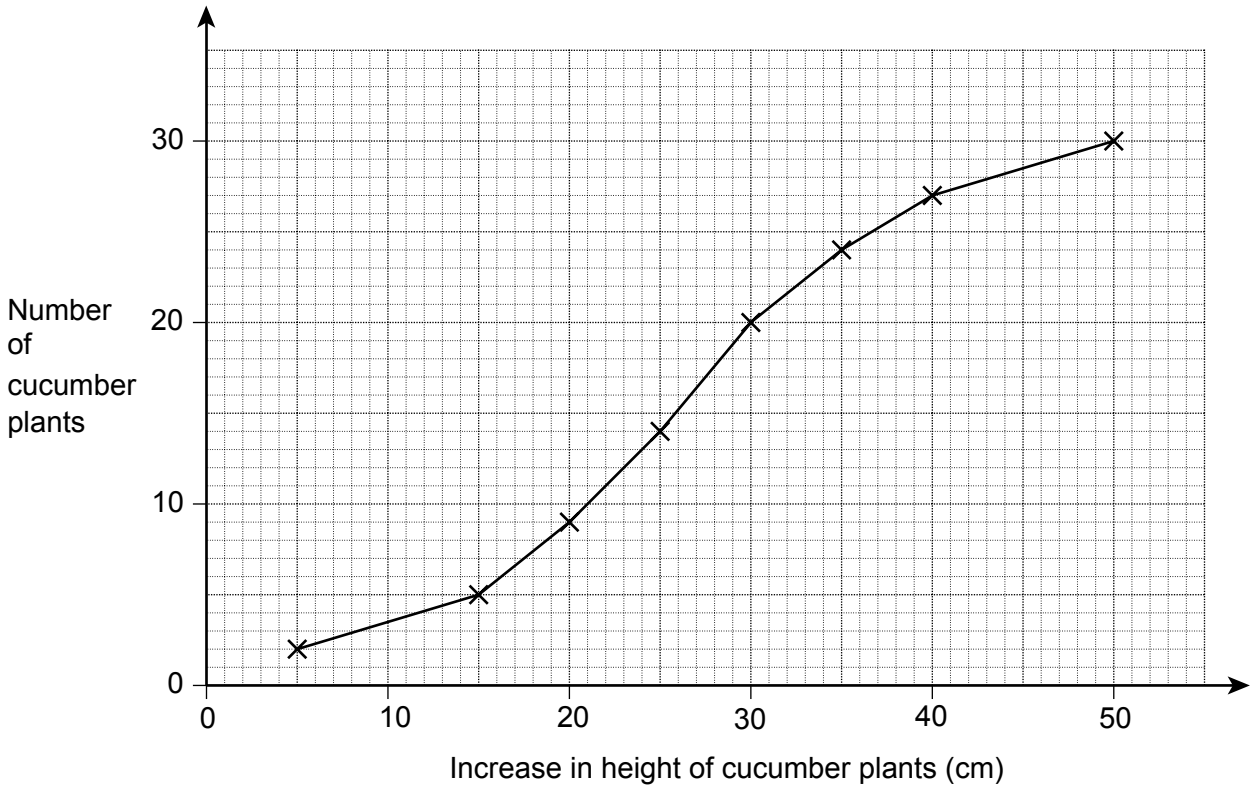
Answer ..... *(3 marks)*

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



3 (a) How many cucumber plants from the **first** batch have increased in height by more than 31 cm?

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Answer ..... *(2 marks)*

3 (b) The smallest increase in height was 5 cm.
On the graph paper at the top of the next page, draw a box plot from the cumulative frequency diagram for the **first** batch of cucumber plants.

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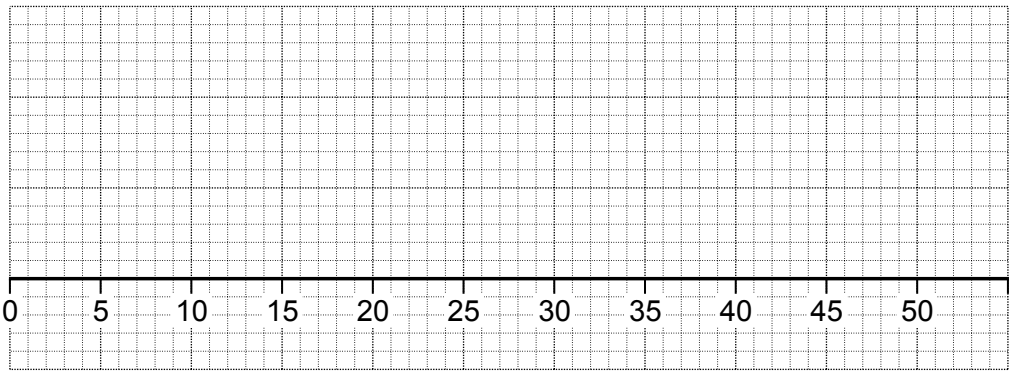
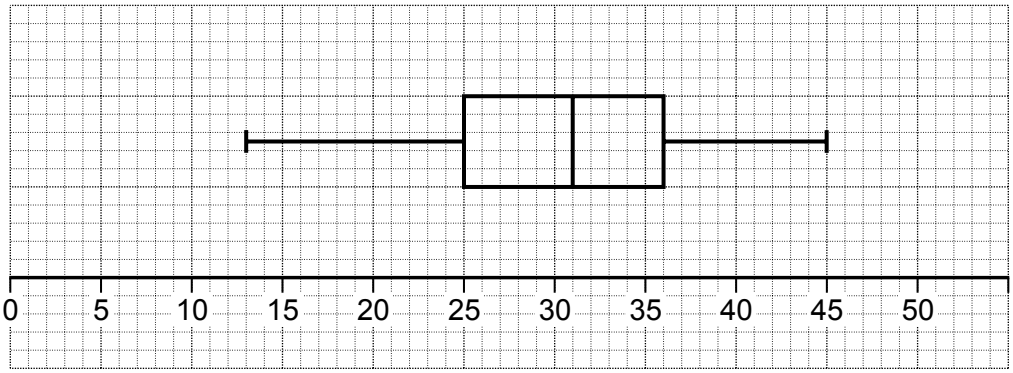


(3 marks)

The **second** batch of 30 cucumber plants was treated with *Speedygrow*.
This box plot shows the results of the **second** batch when Helen measured the increase in their heights six weeks later.



3 (c) The label on the packet of *Speedygrow* says

> Use *Speedygrow* for consistent results.
> Make your plants bigger.

Give **two** reasons to support the claims on the packet.

Reason 1 .....

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Reason 2 .....

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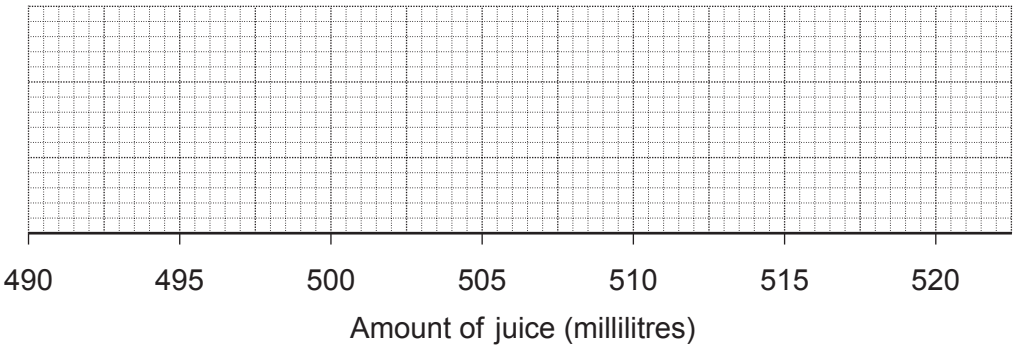
(2 marks)

4 In a factory two machines, A and B, fill bottles with juice.
Each bottle should contain 500 millilitres of juice.

4 (a) Here is some information about the amount of juice contained in a sample of bottles from machine A.

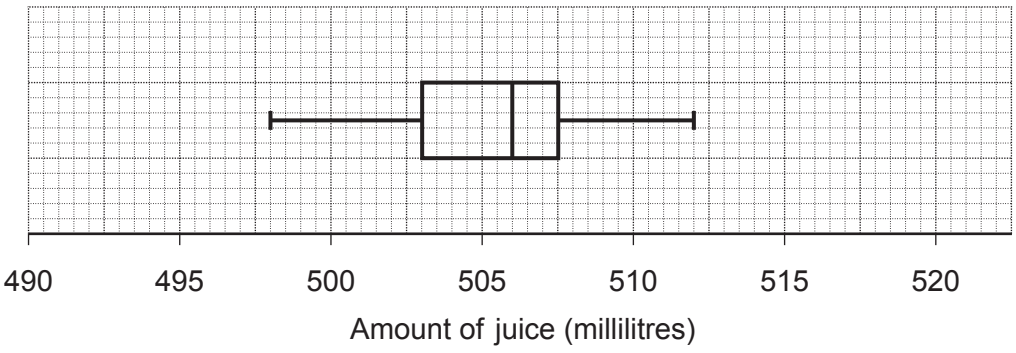
Minimum	Lower quartile	Median	Upper quartile	Maximum
496 ml	502 ml	508 ml	510 ml	514 ml

4 (a) (i) Draw a box plot to represent this information.



(2 marks)

4 (a) (ii) The box plot shows information about a sample of bottles from machine B.



Derek wants to replace one of the machines. Which machine should he replace?
Tick a box ☐ machine A ☐ machine B

Give **two** reasons for your answer.

Reason 1 .....

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Reason 2 .....

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(2 marks)

4 (b) The contents of the sample bottles are given to the nearest millilitre.

Work out the greatest possible difference between the contents of two of the sample bottles from machine A.

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Answer ..... ml *(2 marks)*

4 (c) The factory buys two more machines, C and D.
The four machines fill a total of 6000 bottles each day.

A sample, stratified by the number of bottles filled per day, is taken.
Some information about the sample is given in the table.

Machine	**A**	**B**	**C**	**D**
Number of bottles per day	1550			1800
Number in sample	31	24		

Complete the table.

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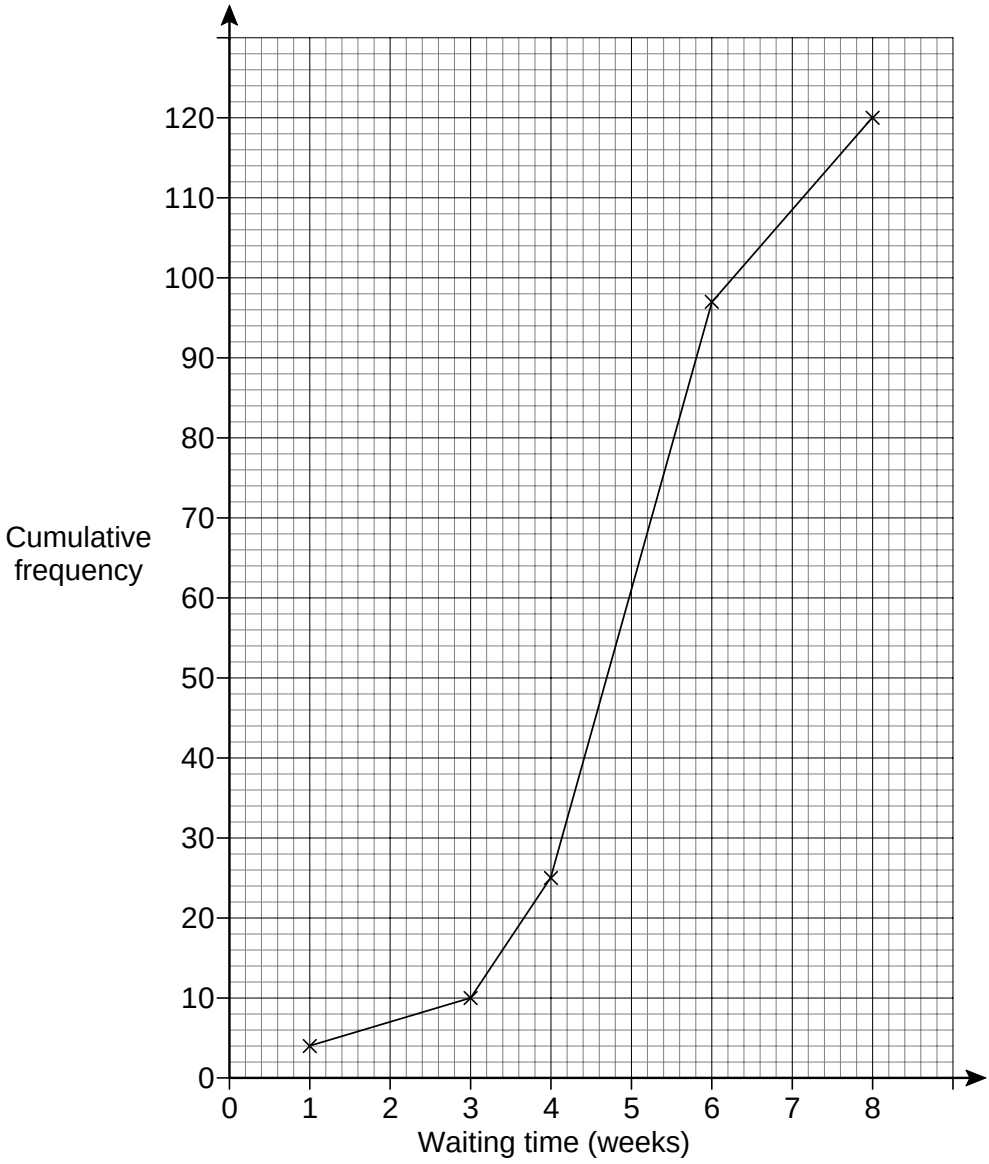
(4 marks)

5 The cumulative frequency diagram shows the waiting times for 120 learner drivers wanting to take their practical driving test.



5 (a) The test centre claims that 75% of learners wait less than 40 days for the test.

Comment on this claim.

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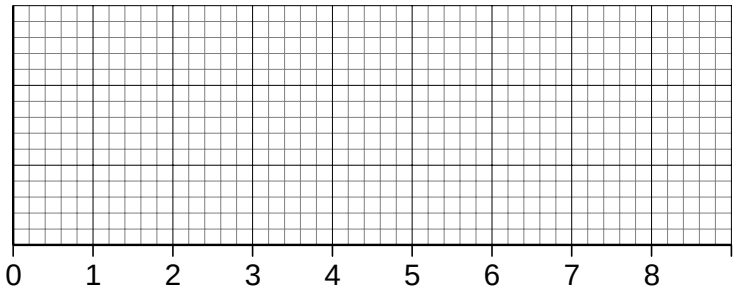
(3 marks)

5 (b) The least waiting time was 1 week.
The range of waiting times was 7 weeks.

Use this information and the cumulative frequency diagram to draw a box plot for the waiting times



(3 marks)

5 (c) At a different test centre 746 took the driving test. This table shows the age and gender of the patients.

	Age		
	Under 18	**18 – 65**	**Over 65**
Male	84	3	50
Female	39	1	37

Sheila wants the test centre to take a stratified sample of 80 patients.

Complete the table below to show how many people from each group should be sampled.

	Age		
	Under 18	**18 – 65**	**Over 65**
Male			
Female			

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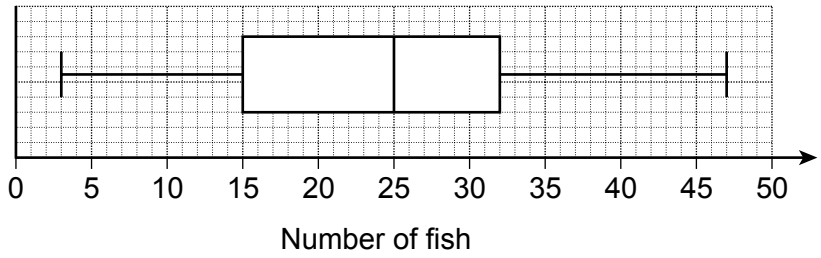
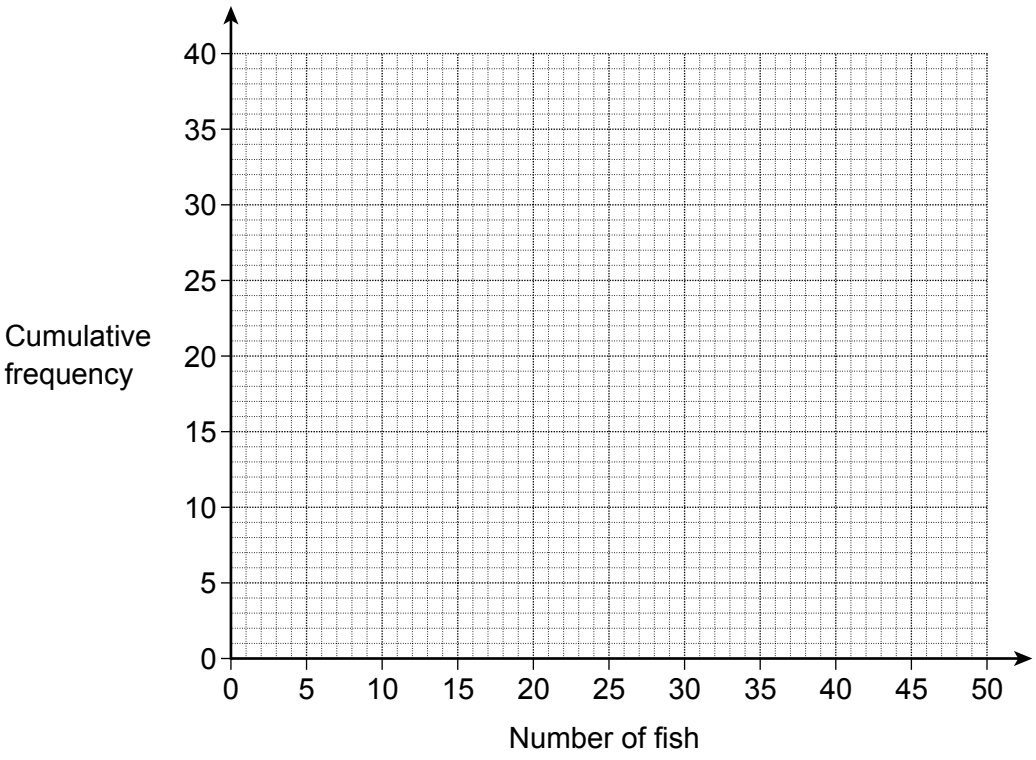
(3 marks)

6 The box plot shows the number of fish caught by forty anglers in a fishing match.
Two anglers caught the lowest number of 3





6 (a) Use the box plot to draw a cumulative frequency diagram for the numbers of fish the forty anglers caught.

(3 marks)

6 (b) What is the probability that an angler picked at random from the match caught more than 32 fish?

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Answer ..... *(1 mark)*

There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED