1MA1 Higher themed papers: Statistical diagrams – Box plots

Write your name here

Surname | Other names

Centre Number | Candidate Number

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Mathematics

Box plots

Paper Reference
1MA1

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is **43**. There are **10** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

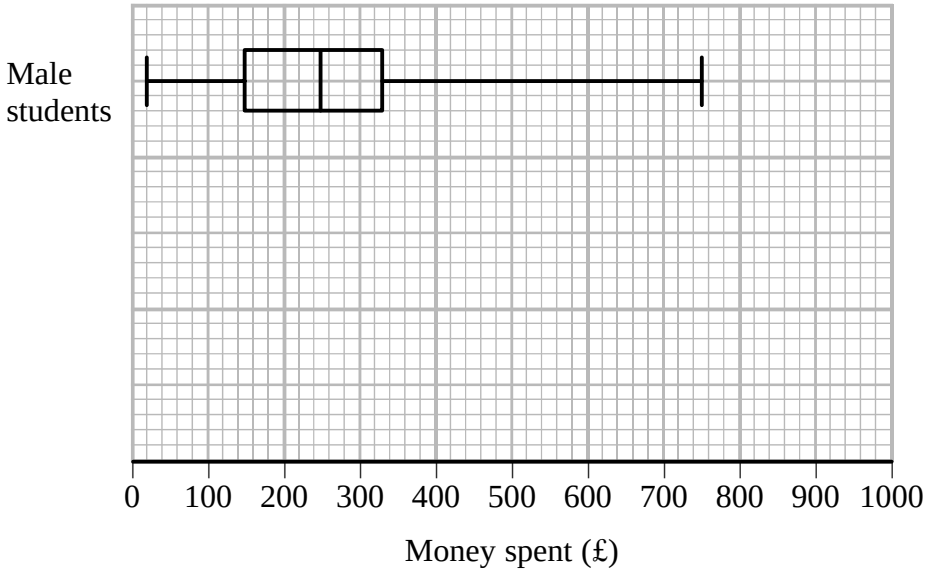
Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.

Check your answers if you have time at the end.

1MA1 Higher themed papers: Statistical diagrams – Box plots

1 The box plot shows information about the distribution of the amounts of money spent by some male students on their holidays.



(*a*) Work out the interquartile range for the amounts of money spent by these male students.

£.....

(2)

The table below shows information about the distribution of the amounts of money spent by some female students on their holidays.

	Smallest	Lower quartile	Median	Upper quartile	Largest
Money spent (£)	60	180	300	350	650

(*b*) On the grid above, draw a box plot for the information in the table.

(2)

Chris says,

"The box plots show that the female students spent more money than the male students."

(*c*) Is Chris correct?
Give a reason for your answer.

.....

.....

.....

.....

(1)

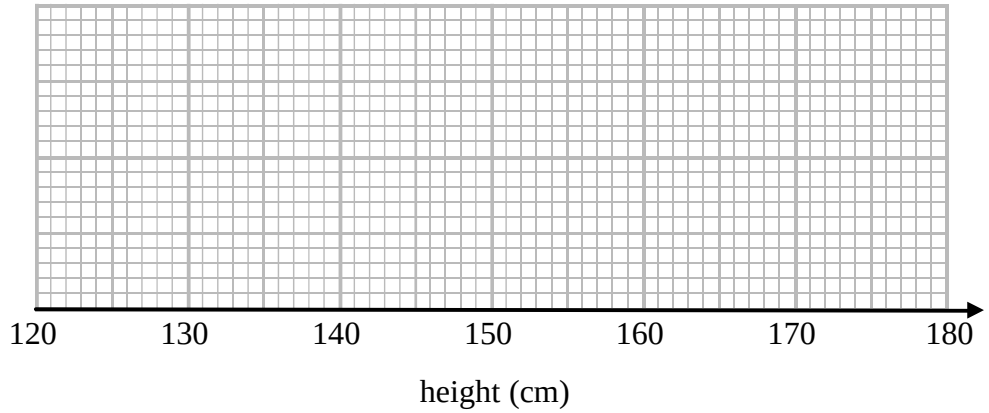
(Total for Question 1 is 5 marks)

---

2 The table gives some information about the heights of 80 girls.

Least height	133 cm
Greatest height	170 cm
Lower quartile	145 cm
Upper quartile	157 cm
Median	151 cm

(*a*) Draw a box plot to represent this information.



(3)

(*b*) Work out an estimate for the number of these girls with a height between 133 cm and 157 cm.

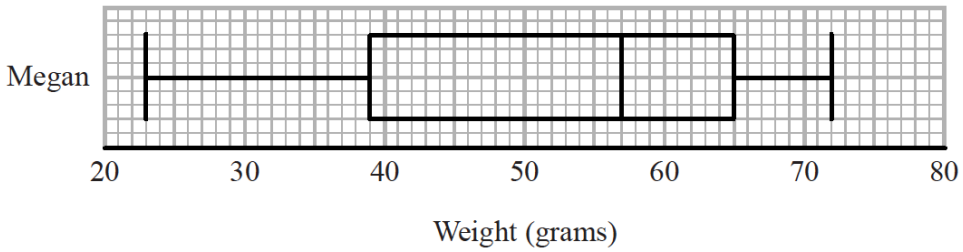
.....

(2)

(Total for Question 2 is 5 marks)

3 Megan grows potatoes.

The box plot below shows information about the weights of Megan's potatoes.



Megan says that half of her potatoes weigh less than 50 grams each.

(*a*) Is Megan correct?

Give a reason for your answer.

.....

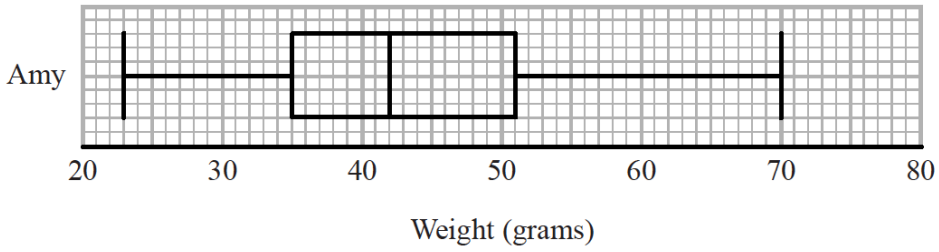
.....

.....

(1)

Amy also grows potatoes.

The box plot below shows information about the weights of Amy's potatoes.



(*b*) Compare the distribution of the weights of Megan's potatoes with the distribution of the weights of Amy's potatoes.

.....

.....

.....

.....

.....

(2)

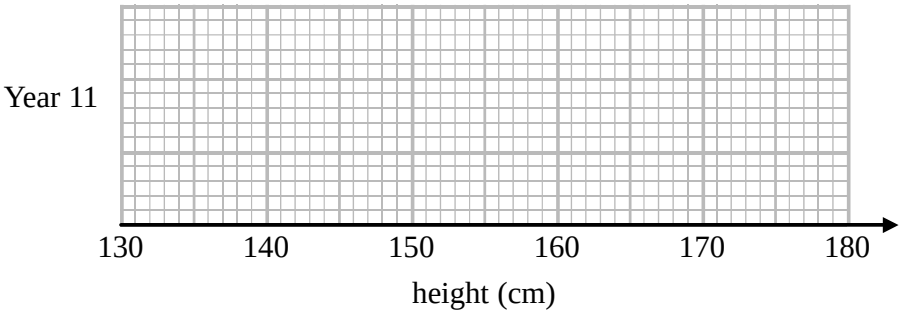
(Total for Question 3 is 3 marks)

---

4 The table shows information about the heights, in cm, of a group of Year 11 girls.

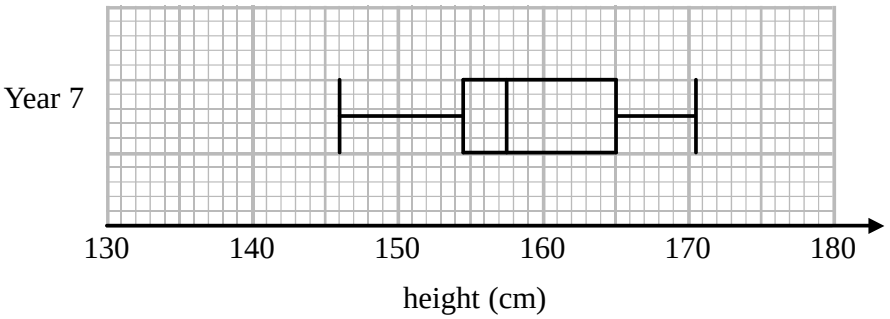
	height (cm)
least height	154
median	165
lower quartile	161
interquartile range	7
range	20

(*a*) Draw a box plot for this information.



(3)

The box plot below shows information about the heights, in cm, of a group of Year 7 girls.



(*b*) Compare the distribution of heights of the Year 11 girls with the distribution of heights of the Year 7 girls.

.....

.....

.....

.....

(2)

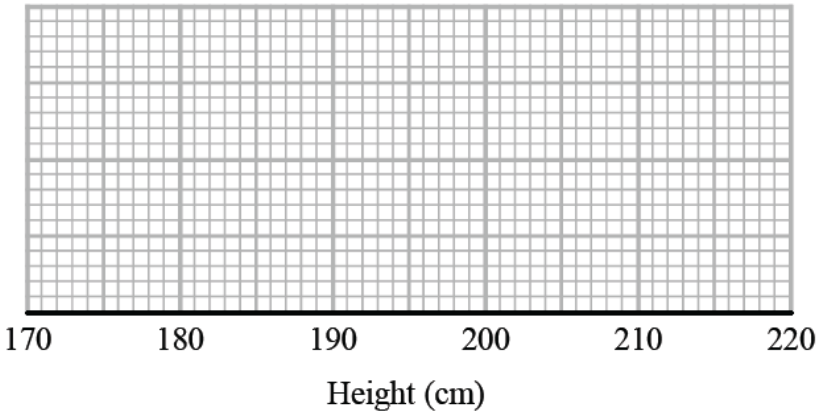
(Total for Question 4 is 5 marks)

5 The stem and leaf diagram shows information about the heights, in cm, of 23 sunflowers.

17	3	4	9				
18	6	8	8				
19	0	0	1	4	6	7	8
20	1	4	7	7	9	9	
21	4	8	8	9			

Key: 17|3 represents 173 cm

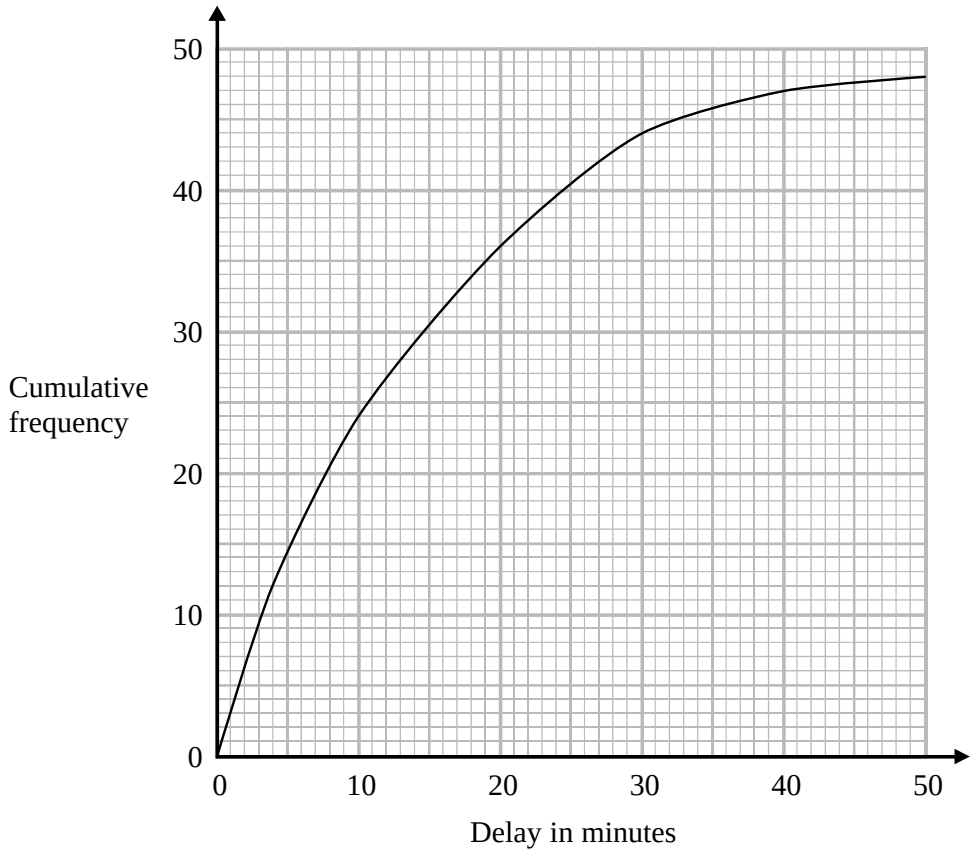
On the grid, draw a box plot for this information.



(Total for Question 5 is 3 marks)

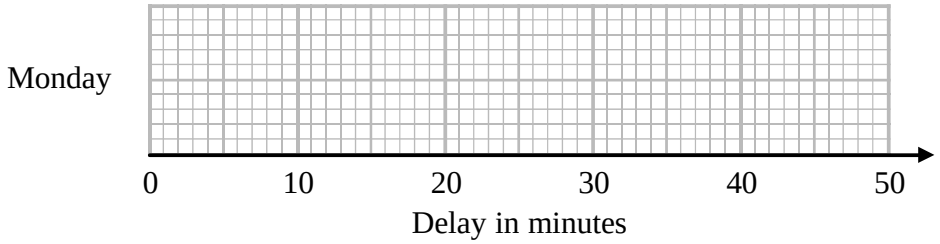
6 The times that 48 trains left a station on Monday were recorded.

The cumulative frequency graph gives information about the numbers of minutes the trains were delayed, correct to the nearest minute.



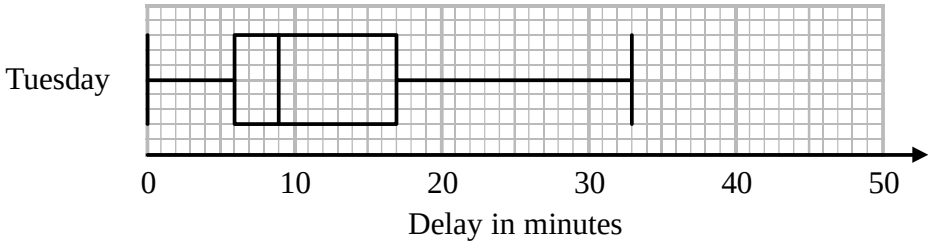
The shortest delay was 0 minutes.
The longest delay was 42 minutes.

(*a*) On the grid below, draw a box plot for the information about the delays on Monday.



(3)

48 trains left the station on Tuesday.
The box plot below gives information about the delays on Tuesday.



(*b*) Compare the distribution of the delays on Monday with the distribution of the delays on Tuesday.

.....

.....

.....

.....

(2)

Mary says,

"The longest delay on Tuesday was 33 minutes.
This means that there must be some delays of between 25 minutes and 30 minutes."

(*c*) Is Mary right?
You must give a reason for your answer.

.....

.....

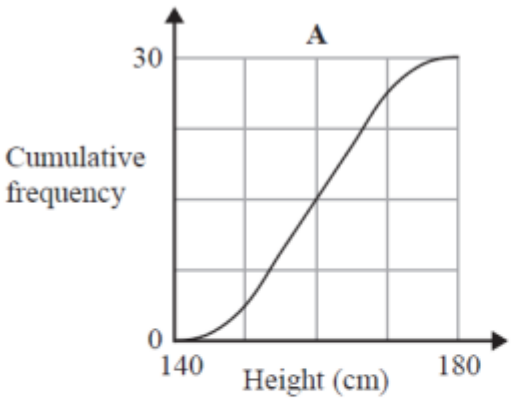
(1)

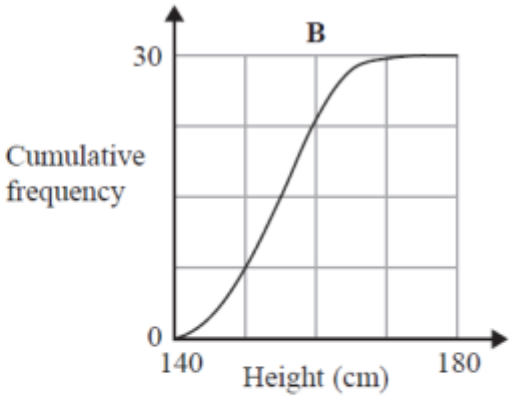
(Total for Question 6 is 6 marks)

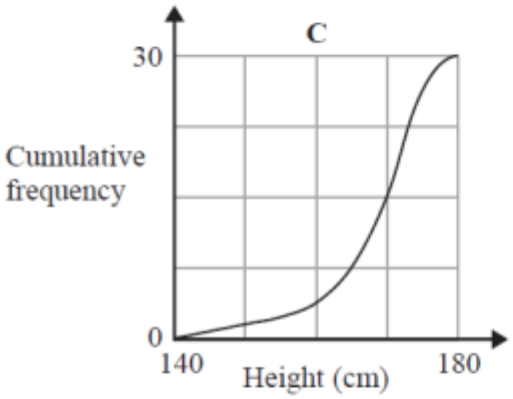
---

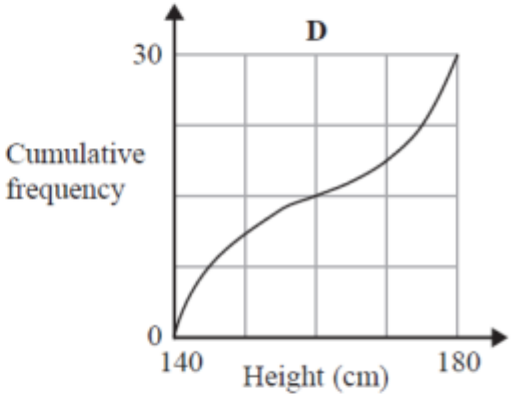
7 Joan measured the heights of students in four different classes.

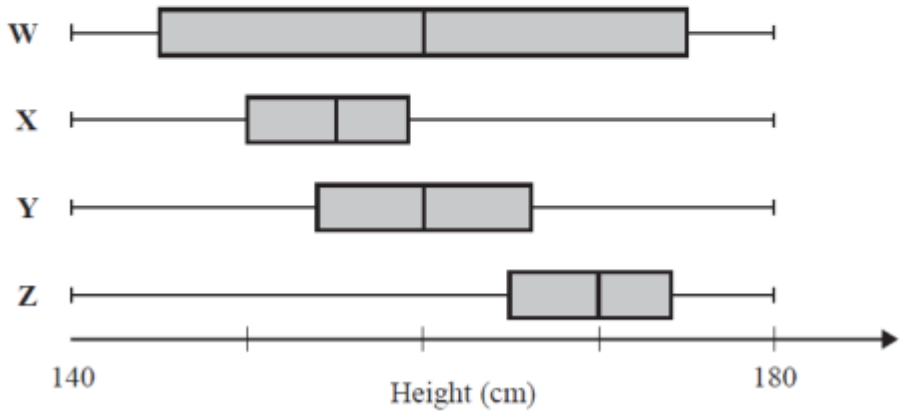
She drew a cumulative frequency graph and a box plot for each class.











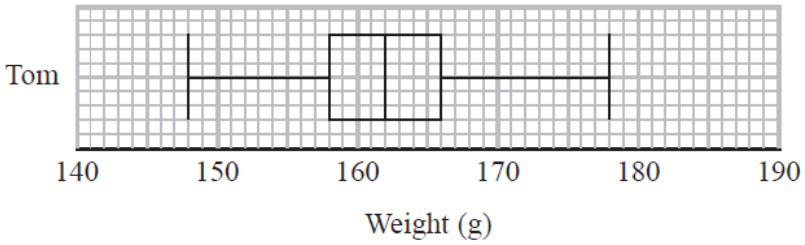
Match each cumulative frequency graph to its box plot.

Cumulative frequency graph	Box plot
A	
B	
C	
D	

(Total for Question 7 is 2 marks)

---

8 Tom grows tomatoes.
The box plot below shows the distribution of the weights of 15 of Tom's tomatoes.



(a) Work out the interquartile range.

..... g

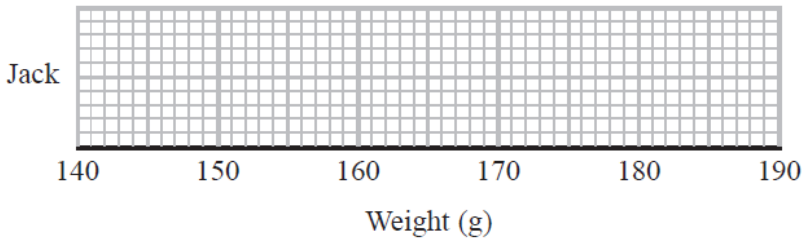
(1)

Jack also grows tomatoes.

Here are the weights, in grams, of 15 of Jack's tomatoes.

153	155	158	164	166	167	170	170	173	174	175	175	177	179	186

(b) On the grid below, draw a box plot for this information.



(3)

(c) Compare the distribution of the weights of Tom's tomatoes with the distribution of
the weights of Jack's tomatoes.

.....

.....

.....

.....

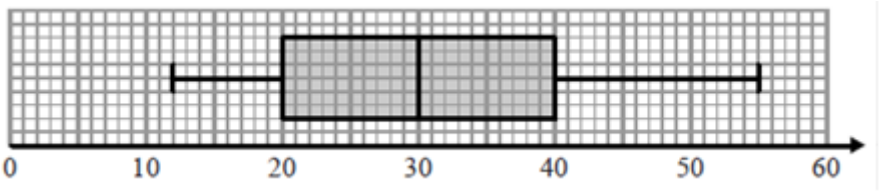
(2)

(Total for Question 8 is 6 marks)

9 The table shows some information about the weights, in kg, of some boxes.

Minimum	Lower Quartile	Median	Upper Quartile	Range
12	20	32	40	55

Ben uses this information to draw the box plot below.



Write down two things wrong with this box plot.

1.....

2.....

(Total for Question 9 is 2 marks)

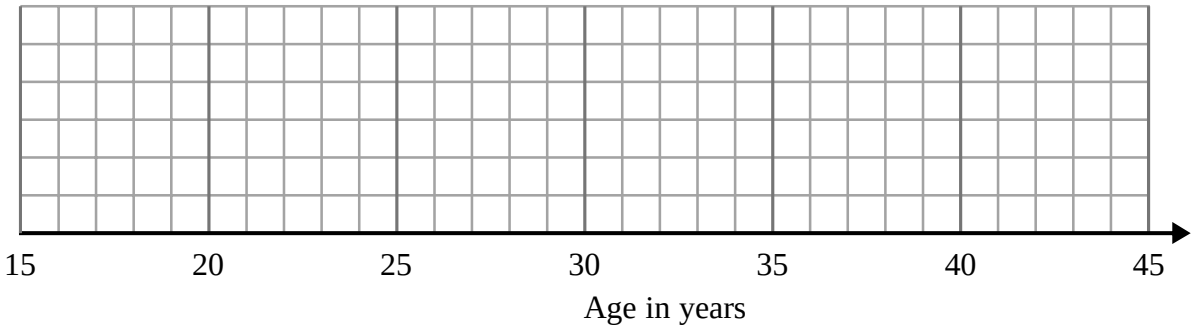
---

10 The stem and leaf diagram shows the ages, in years, of 25 people.

1	7	7	8	9							
2	1	2	4	4	5	5	6	7	8	9	9
3	0	1	2	2	3	4	5	6			
4	0	1									

Key: 1 | 7 represents 17 years

(*a*) (i) On the grid, draw a box plot for this information.



(3)

One of these people is chosen at random.

(ii) What is the probability that this person is 30 years of age or older?

.....

(2)

The grouped frequency table gives information about the ages of a different group of people.

Age (a years)	Frequency
$0 < a \leqslant 20$	7
$20 < a \leqslant 30$	12
$30 < a \leqslant 40$	5
$40 < a \leqslant 50$	1

Anne drew this cumulative frequency table for this information.

Age (a years)	Cumulative frequency
$0 < a \leqslant 20$	7
$20 < a \leqslant 30$	19
$30 < a \leqslant 40$	24
$40 < a \leqslant 50$	25

The cumulative frequency table is **not** correct.

(b) Write down one thing that is wrong with the table.

.....

(1)

(Total for Question 10 is 6 marks)

TOTAL MARKS FOR PAPER: 43