

1. The age in months at which a child first starts to walk is observed for a random group of children from a town in Brazil. The results are

14.3, 11.6, 12.2, 14.0, 20.4, 13.4, 12.9, 11.7, 13.1.

- (a) (i) Find the mean of the ages of these children.  
(ii) Find the standard deviation of the ages of these children.  
(b) Find the median age.

**(Total 6 marks)**

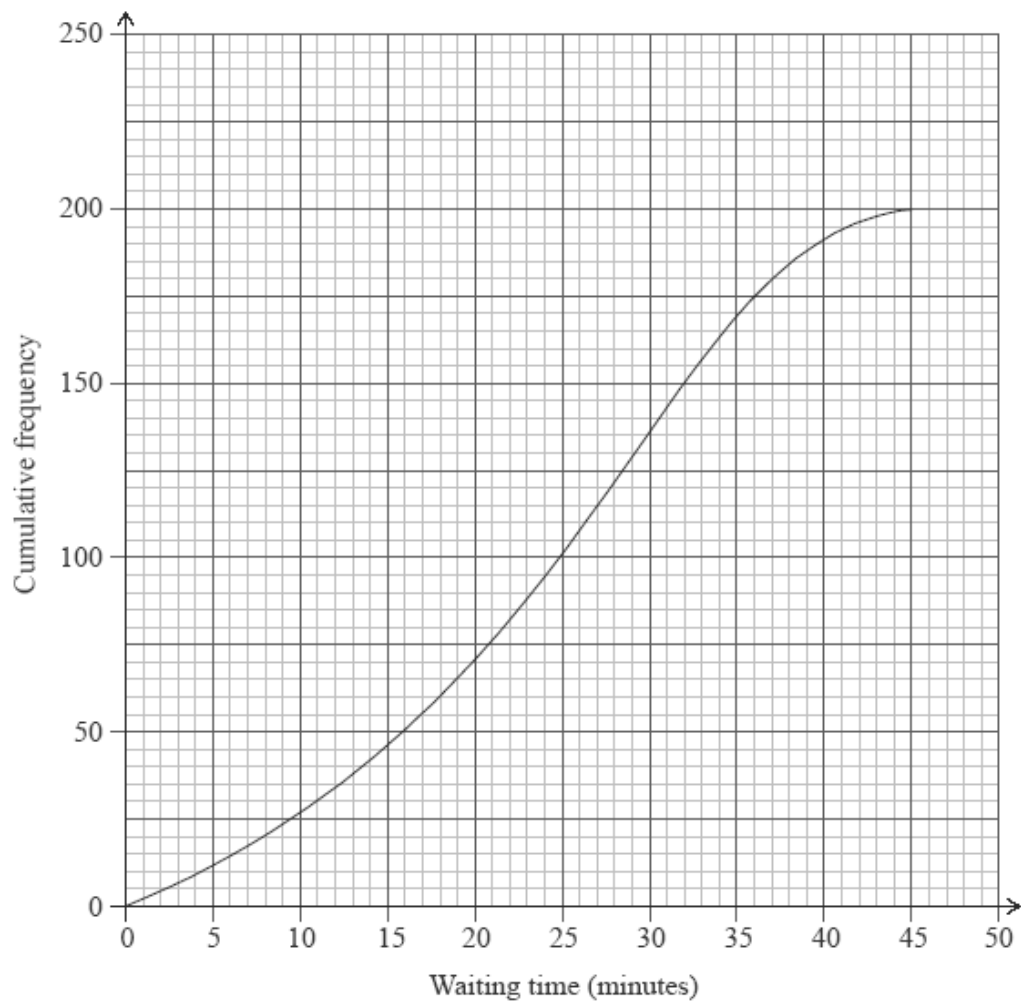
2. The cumulative frequency table below shows the ages of 200 students at a college.

Age	Number of Students	Cumulative Frequency
17	3	3
18	72	75
19	62	137
20	31	$m$
21	12	180
22	9	189
23–25	5	194
> 25	6	$n$

- (a) What are the values of  $m$  and  $n$ ?  
(b) How many students are younger than 20?  
(c) Find the value in years of the lower quartile.

**(Total 8 marks)**

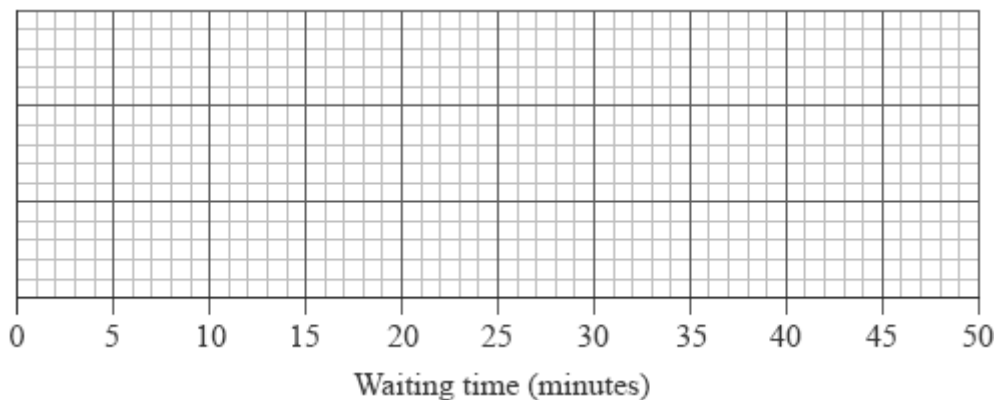
3. The cumulative frequency graph shows the amount of time in minutes, 200 students spend waiting for their train on a particular morning.



- (a) Write down the median waiting time. (1)
- (b) Find the interquartile range for the waiting time. (2)

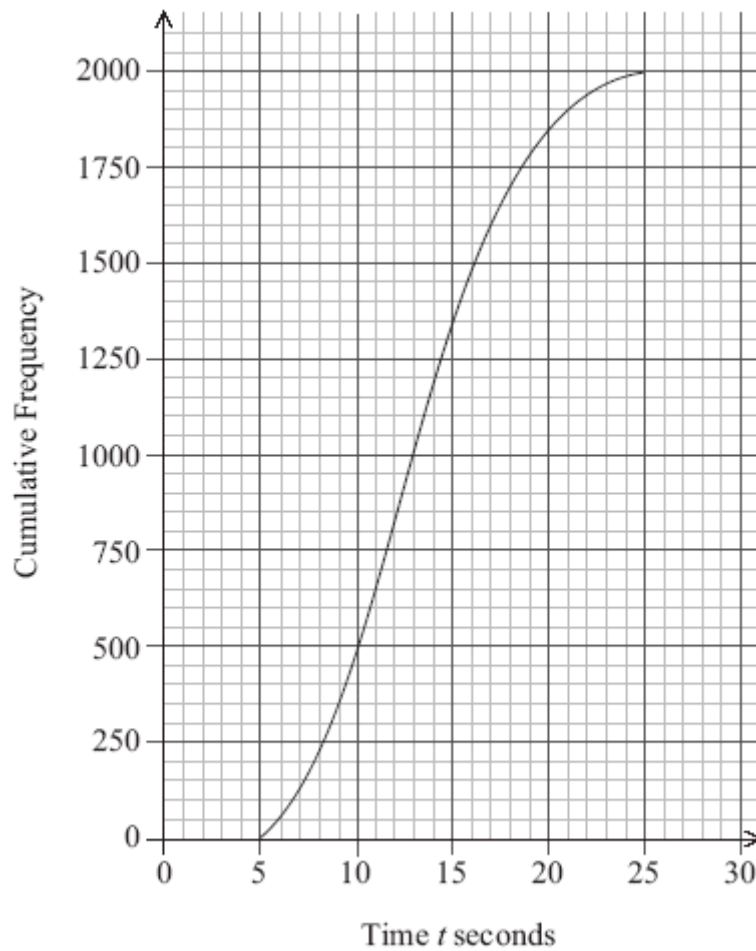
The minimum waiting time is zero and the maximum waiting time is 45 minutes.

- (c) Draw a box and whisker plot on the grid below to represent this information.



(3)  
(Total 6 marks)

4. The diagram shows the cumulative frequency graph for the time  $t$  taken to perform a certain task by 2000 men.



- (a) Use the diagram to estimate
- (i) the median time;
  - (ii) the upper quartile and the lower quartile;
  - (iii) the interquartile range.
- (4)
- (b) Find the number of men who take **more than** 11 seconds to perform the task.
- (3)
- (c) 55 % of the men took less than  $p$  seconds to perform the task. Find  $p$ .
- (2)

The times taken for the 2000 men were grouped as shown in the table below.

Time	Frequency
$5 \leq t < 10$	500
$10 \leq t < 15$	850
$15 \leq t < 20$	$a$
$20 \leq t < 25$	$b$

(d) Write down the value of

(i)  $a$ ;

(ii)  $b$ .

(2)

(e) Use your graphic display calculator to find an estimate of

(i) the mean time;

(ii) the standard deviation of the time.

(3)

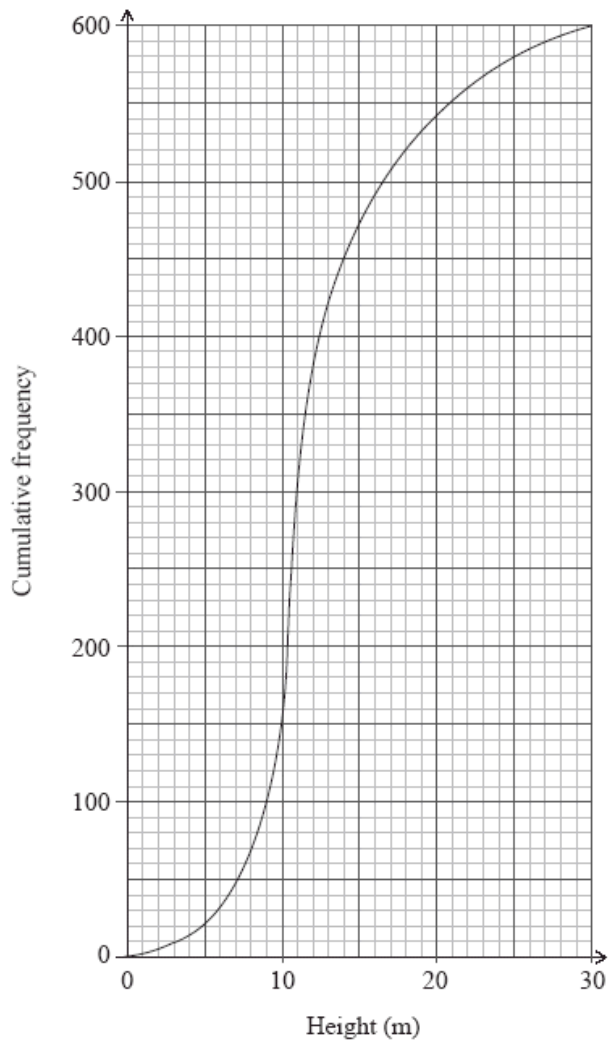
Everyone who performs the task in **less than** one standard deviation **below** the mean will receive a bonus. Pedro takes 9.5 seconds to perform the task.

(f) Does Pedro receive the bonus? Justify your answer.

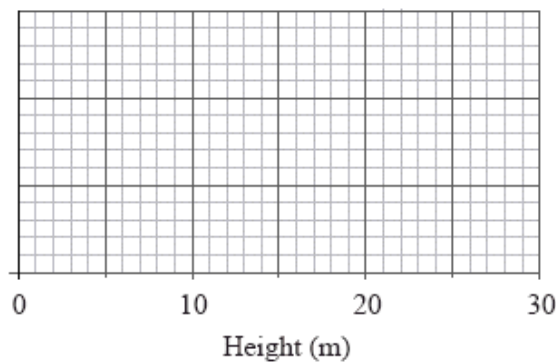
(3)

(Total 17 marks)

5. The diagram below shows the cumulative frequency distribution of the heights in metres of 600 trees in a wood.



- (a) Write down the median height of the trees. (1)
- (b) Calculate the interquartile range of the heights of the trees. (2)
- (c) Given that the smallest tree in the wood is 3 m high and the tallest tree is 28 m high, draw the box and whisker plot on the grid below that shows the distribution of trees in the wood.

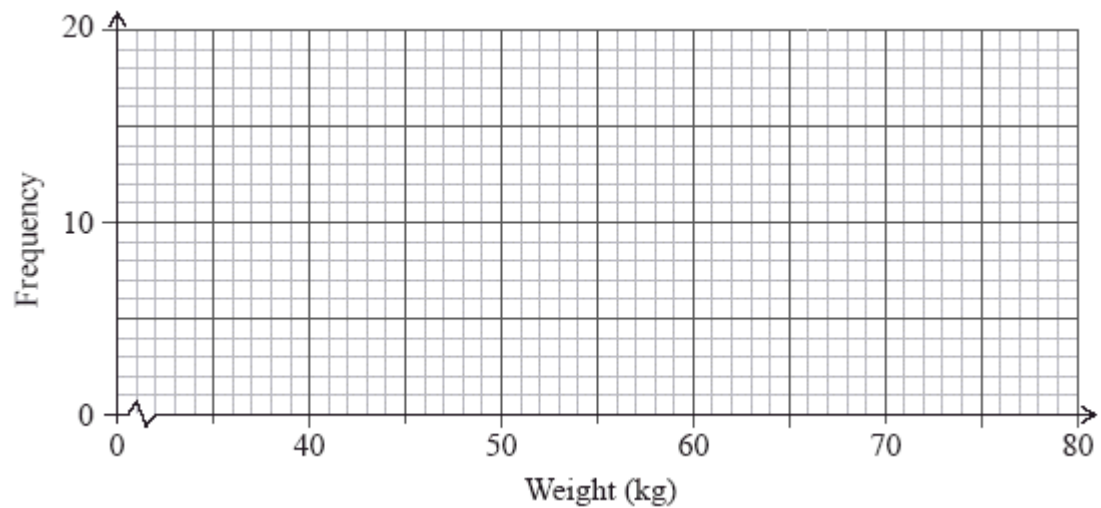


(3)  
(Total 6 marks)

6. The distribution of the weights, correct to the nearest kilogram, of the members of a football club is shown in the following table.

Weight (kg)	40 – 49	50 – 59	60 – 69	70 – 79
Frequency	6	18	14	4

- (a) On the grid below draw a histogram to show the above weight distribution.



(2)

- (b) Write down the mid-interval value for the 40 – 49 interval.

(1)

- (c) Find an estimate of the mean weight of the members of the club.

(2)

- (d) Write down an estimate of the standard deviation of their weights.

(1)

(Total 6 marks)

7. The weights of 90 students in a school were recorded. The information is displayed in the following table.

Weight (kg)	Number of students
$40 \leq w < 50$	7
$50 \leq w < 60$	28
$60 \leq w < 70$	35
$70 \leq w < 80$	20

- (a) Write down the mid interval value for the interval  $50 \leq w < 60$ .

(1)

- (b) Use your graphic display calculator to find an estimate for

- (i) the mean weight;  
(ii) the standard deviation.

(3)

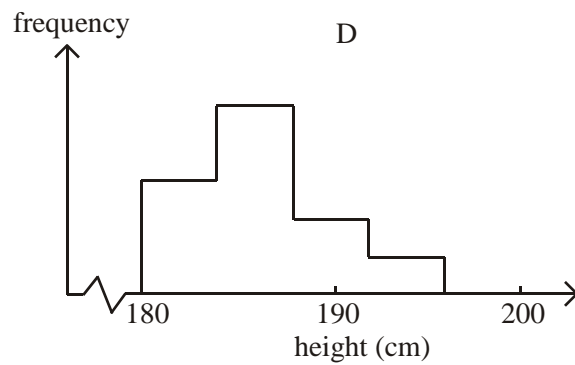
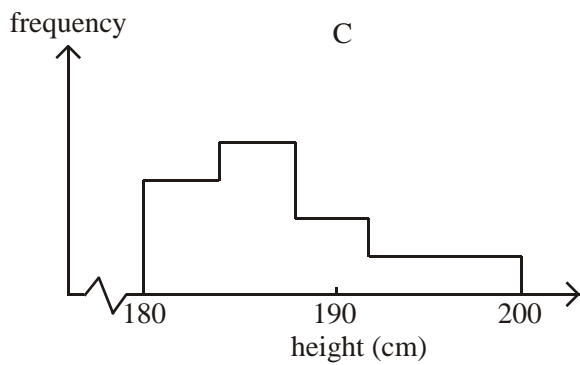
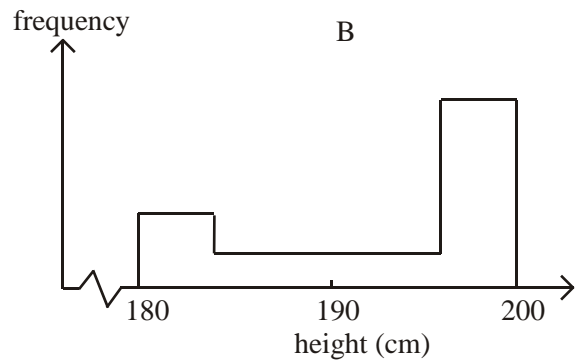
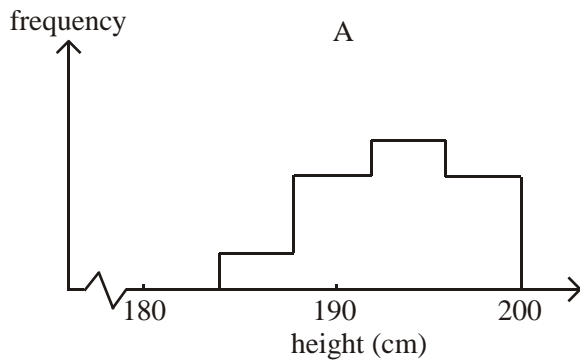
- (c) Find the weight that is 3 standard deviations below the mean.

(2)

(Total 6 marks)

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8. The heights in cm of the members of 4 volleyball teams A, B, C and D were taken and represented in the frequency histograms given below.



The mean  $\bar{x}$  and standard deviation  $\sigma$  of each team are shown in the following table.

	I	II	III	IV
$\bar{x}$	194	189	188	195
$\sigma$	6.50	4.91	3.90	3.74

Match each pair of  $\bar{x}$  and  $\sigma$  (I, II, III, or IV) to the correct team (A, B, C or D).

$\bar{x}$ and $\sigma$	Team
I	
II	
III	
IV	

(Total 6 marks)