

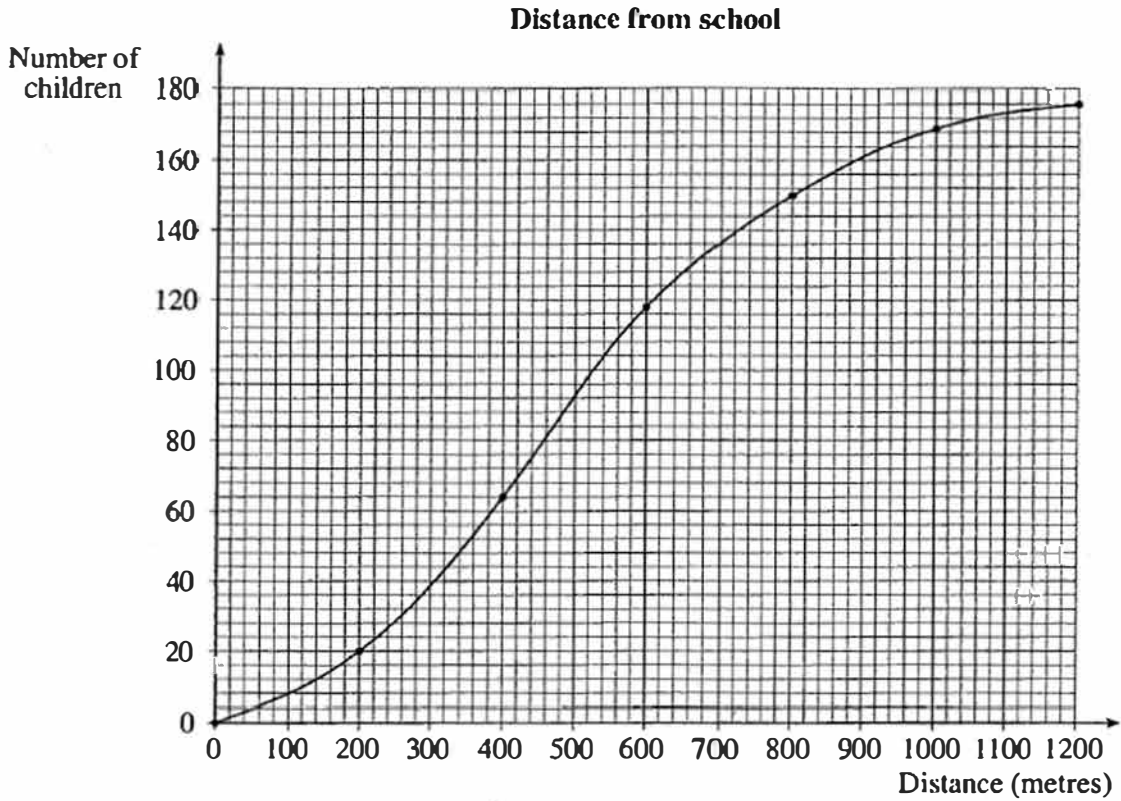
1 The number of minutes of recorded music on a sample of 100 CDs is summarised below.

Time (t minutes)	$40 \leq t < 45$	$45 \leq t < 50$	$50 \leq t < 60$	$60 \leq t < 70$	$70 \leq t < 90$
Number of CDs	26	18	31	16	9

(i) Illustrate the data by means of a histogram. [5]

(ii) Identify two features of the distribution. [2]

- 2 The cumulative frequency graph below illustrates the distances that 176 children live from their primary school.



- (i) Use the graph to estimate, to the nearest 10 metres,
- (A) the median distance from school, [2]
- (B) the lower quartile, upper quartile and interquartile range. [3]
- (ii) Draw a box and whisker plot to illustrate the data. [3]

The graph on page 4 used the following grouped data.

Distance (metres)	200	400	600	800	1000	1200
Cumulative frequency	20	64	118	150	169	176

(iii) Copy and complete the grouped frequency table below describing the same data. [2]

Distance (d metres)	Frequency
$0 < d \leq 200$	20
$200 < d \leq 400$	

(iv) Hence estimate the mean distance these children live from school. [3]

It is subsequently found that none of the 176 children lives within 100 metres of the school.

(v) Calculate the revised estimate of the mean distance. [2]

(vi) Describe what change needs to be made to the cumulative frequency graph. [2]

- 3 The stem and leaf diagram illustrates the heights in metres of 25 young oak trees.

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

Key: 4 | 2 represents 4.2

- (i) State the type of skewness of the distribution. [1]
- (ii) Use your calculator to find the mean and standard deviation of these data. [3]
- (iii) Determine whether there are any outliers. [4]
- 4 At a call centre, 85% of callers are put on hold before being connected to an operator. A random sample of 30 callers is selected.
- (i) Find the probability that exactly 29 of these callers are put on hold. [3]
- (ii) Find the probability that at least 29 of these callers are put on hold. [3]
- (iii) If 10 random samples, each of 30 callers, are selected, find the expected number of samples in which at least 29 callers are put on hold. [2]