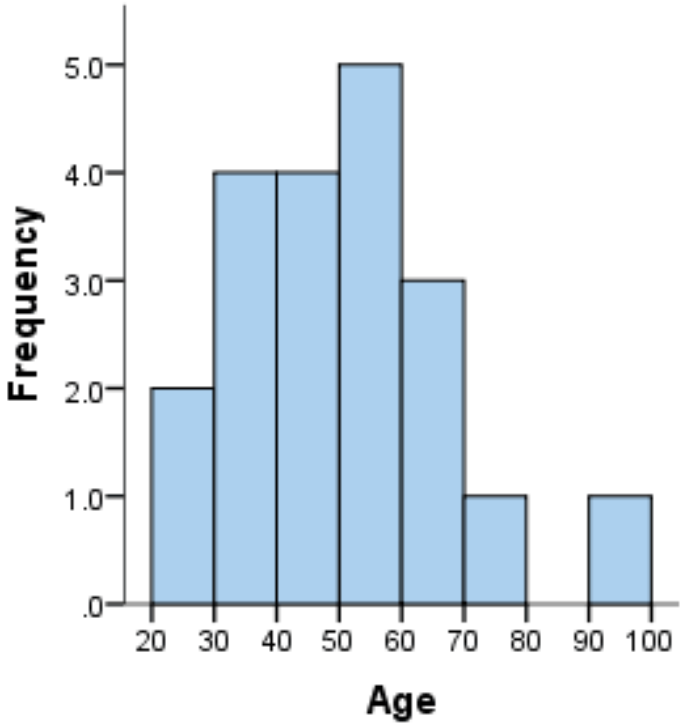
PRESENTATION OF DATA

Histograms

A histogram is very similar to a bar chart but bar charts are used for graphing qualitative data and histograms are used for quantitative data.

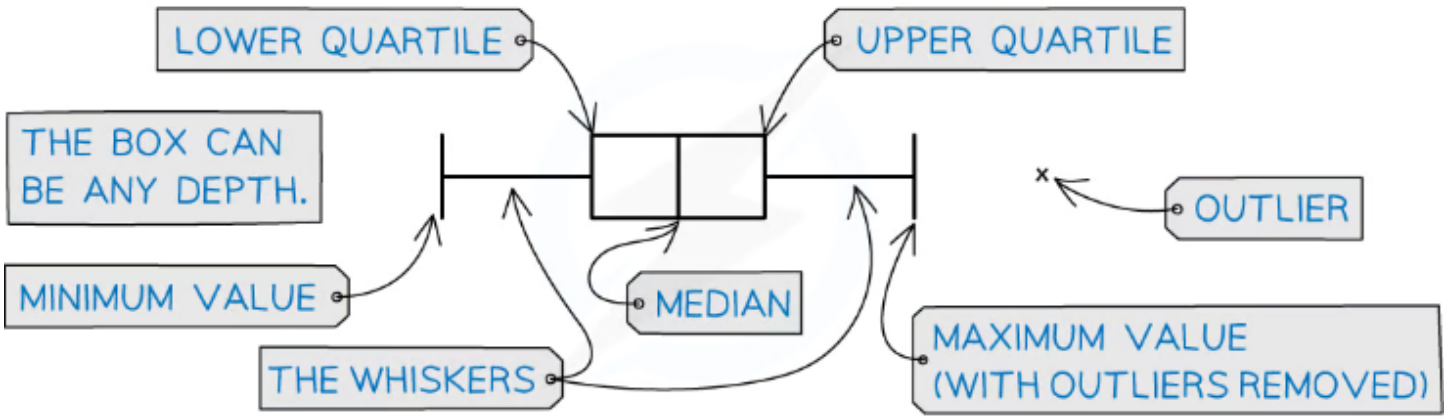
Histograms are graphical representations of frequency distributions for continuous data. They consist of adjacent rectangles with areas proportional to the frequencies of the class intervals they represent.



Box and Whiskers

A box and whisker plot—also called a box plot—displays the five-number summary of a set of data. The five-number summary is the minimum, first quartile, median, third quartile, and maximum.

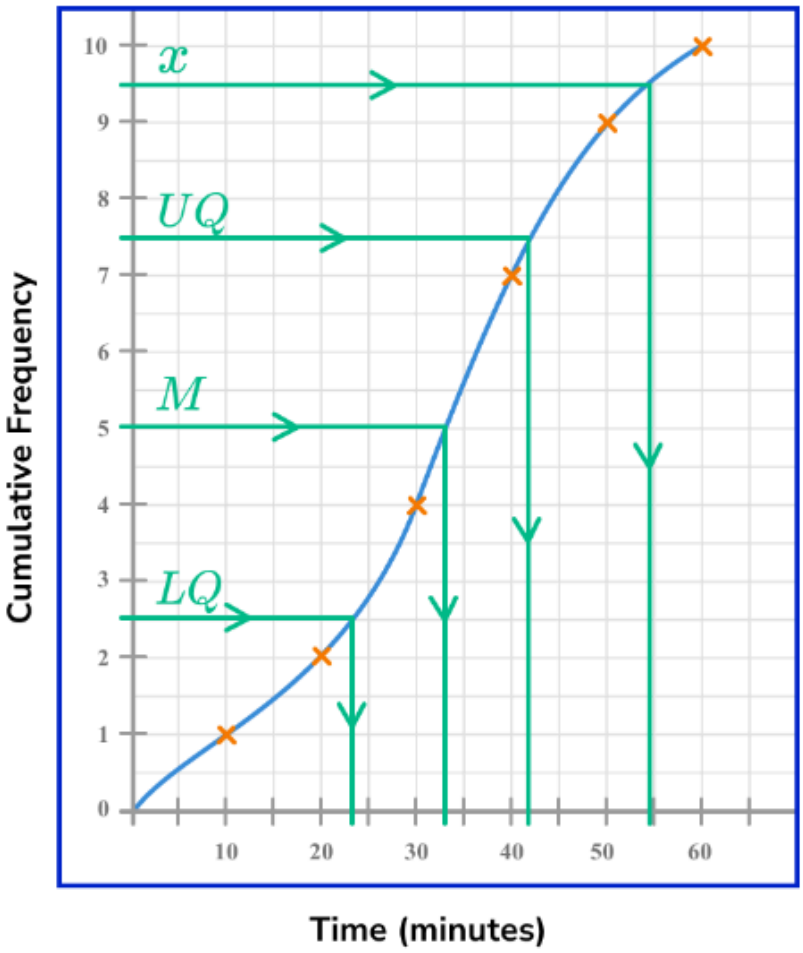
A box plot is a graph that clearly shows key statistics from a data set. It shows the median, quartiles, minimum and maximum values and outliers. The middle 50% of the data will be represented by the box section of the graph and the lower and upper 25% of the data will be represented by each of the whiskers. Any outliers are represented with a cross on the outside of the whiskers
If there is an outlier then the whisker will end at the value before the outlier



Cumulative Frequencies

The cumulative frequency of a set of data or class intervals of a frequency table is the sum of the frequencies of the data up to a required level. It can be used to determine the number of items that have values below a particular level.

Cumulative frequency (CF) represents the running total of frequencies up to each class interval. It's particularly useful for finding median, quartiles, and percentiles.



Example 1.
Represent the following data in a histogram

36	25	38	46	55	68	72	55	36	38
67	45	22	48	91	46	52	61	58	55

Example 2.
A sample of 10 boxes of raisins has these weights (in grams): 25, 28, 29, 29, 30, 34, 35, 35, 37, 38.
Represent the data in a box and whiskers plot.

Example 3.

The following table shows the frequency of a certain data. Construct a cumulative frequency table as well as cumulative frequency curve.

Marks	Frequency
$0 \leq x < 10$	5
$10 \leq x < 20$	19
$20 \leq x < 30$	30
$30 \leq x < 40$	20
$40 \leq x < 50$	6

Example 4.

A health inspector analysed the amount of sugar in 500 different **snacks** prepared in various school cafeterias. The collected data are shown in the following box-and-whisker diagram.

Amount of sugar per snack in grams

(a) State what 13 represents in the given diagram. [1]

(b) (i) Write down the interquartile range for this data.

(ii) Write down the approximate number of snacks whose amount of sugar ranges from 18 to 20 grams. [3]

Example 5.

University students were surveyed and asked how many hours, h, they worked each month. The results are shown in the following table.

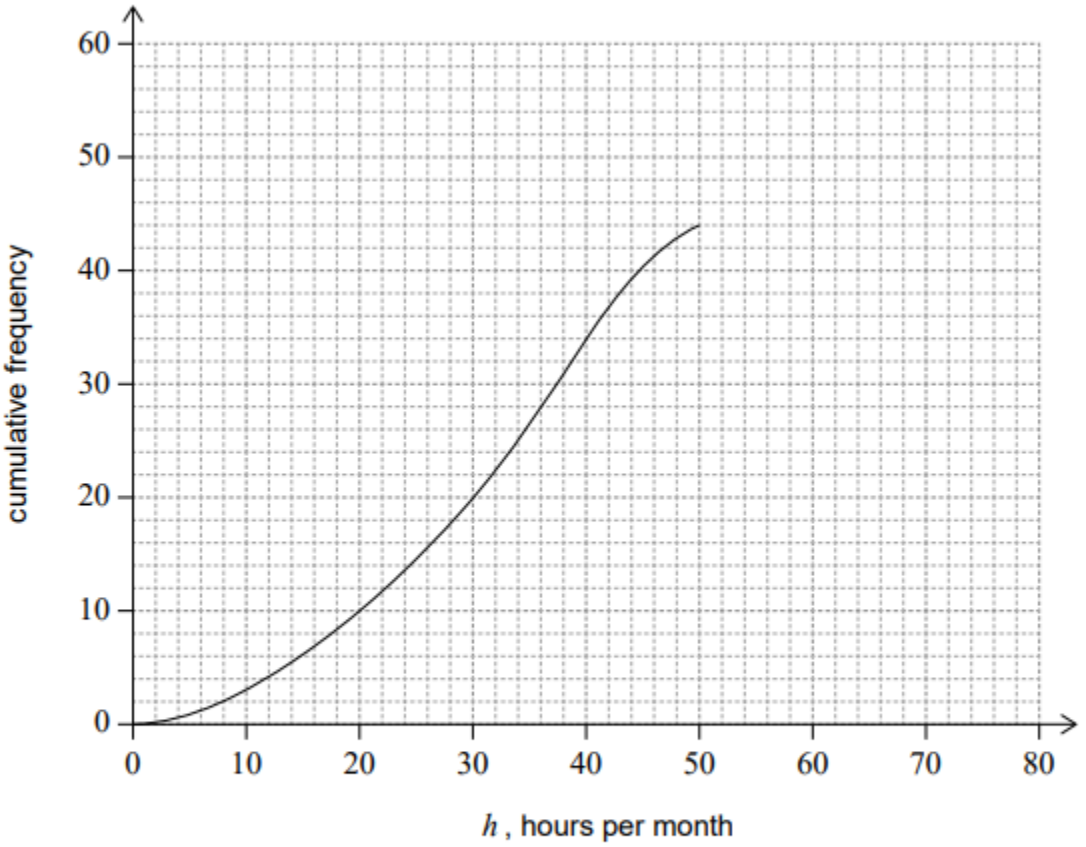
Hours per month, h	Frequency	Cumulative frequency
$0 < h \leq 10$	3	3
$10 < h \leq 20$	7	10
$20 < h \leq 30$	10	20
$30 < h \leq 40$	14	34
$40 < h \leq 50$	p	44
$50 < h \leq 60$	6	50
$60 < h \leq 70$	4	54
$70 < h \leq 80$	2	q

(a) Use the table to find the following values.

(i) p

(ii) q [2]

The first five class intervals, indicated in the table, have been used to draw part of a cumulative frequency curve as shown.

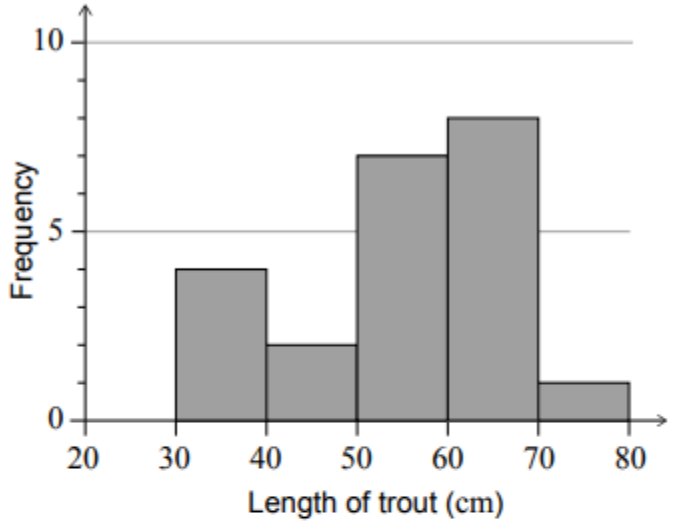


(b) On the same grid, complete the cumulative frequency curve for these data. [2]

(c) Use the cumulative frequency curve to find an estimate for the number of students who worked at most 35 hours per month. [2]

Example 6.

The lengths of trout in a fisherman's catch were recorded over one month, and are represented in the following histogram.



(a) Complete the following table.

Length of trout	Frequency
20 cm < trout length ≤ 30 cm	0
30 cm < trout length ≤ 40 cm	
40 cm < trout length ≤ 50 cm	
50 cm < trout length ≤ 60 cm	
60 cm < trout length ≤ 70 cm	
70 cm < trout length ≤ 80 cm	1

[2]

(b) State whether **length of trout** is a continuous or discrete variable. [1]