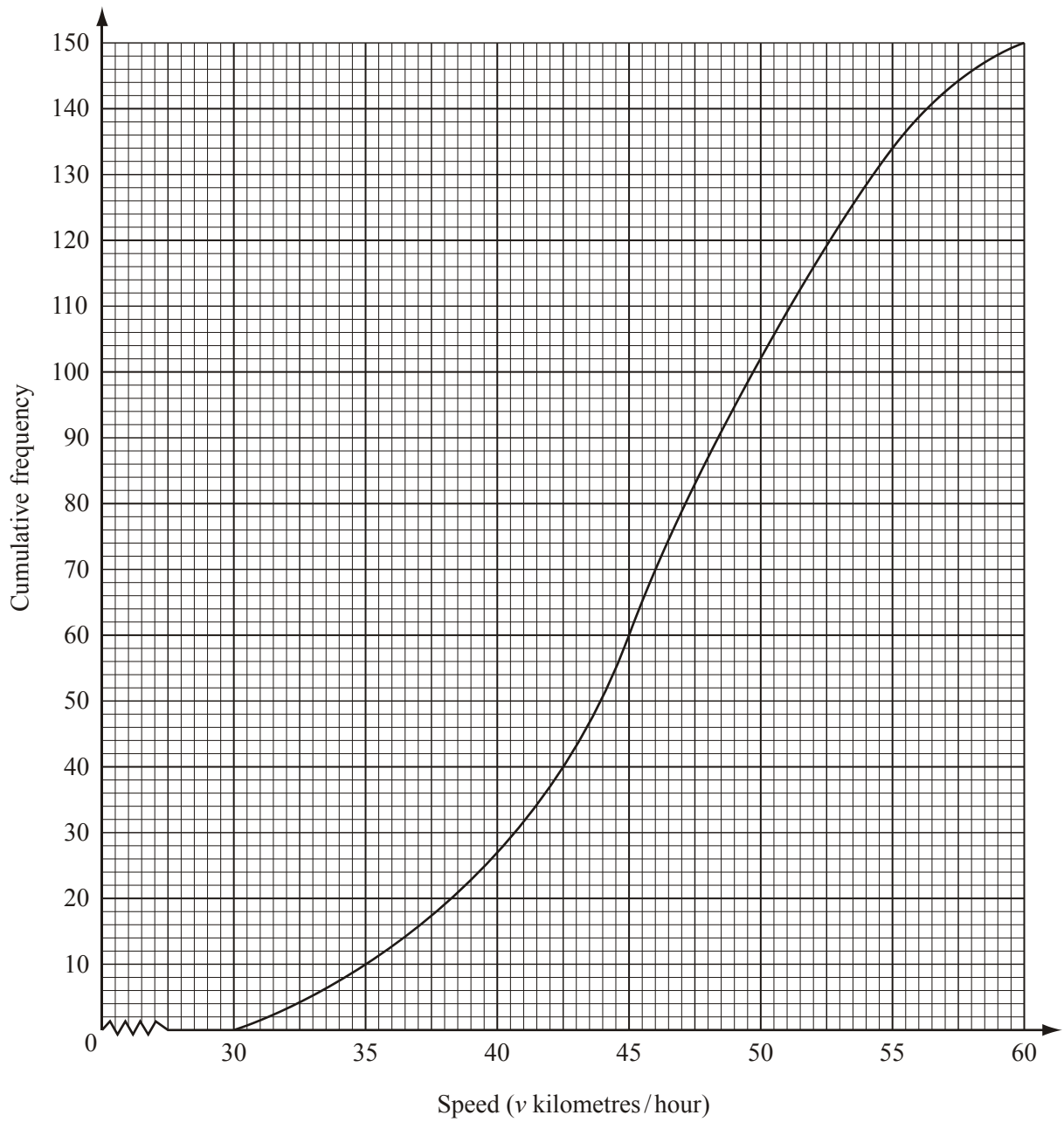


Dulwich College Shanghai

IGCSE - Histograms

49 min
43 marks

- The speeds (v kilometres/hour) of 150 cars passing a 50 km/h speed limit sign are recorded. A cumulative frequency curve to show the results is drawn below.



- (a) Use the graph to find
- (i) the median speed, [1]
 - (ii) the inter-quartile range of the speeds, [2]
 - (iii) the number of cars travelling with speeds of more than 50 km/h. [2]

(b) A frequency table showing the speeds of the cars is

Speed (v km/h)	$30 < v \leq 35$	$35 < v \leq 40$	$40 < v \leq 45$	$45 < v \leq 50$	$50 < v \leq 55$	$55 < v \leq 60$
Frequency	10	17	33	42	n	16

- (i) Find the value of n [1]
- (ii) Calculate an estimate of the mean speed. [4]

Answer the whole of this question on a sheet of graph paper.

(c) Another frequency table for the same speeds is

Speed (v km/h)	$30 < v \leq 40$	$40 < v \leq 55$	$55 < v \leq 60$
Frequency	27	107	16

Draw an accurate histogram to show this information.
 Use 2 cm to represent 5 units on the speed axis and 1 cm to represent 1 unit on the frequency density axis (so that 1 cm^2 represents 2.5 cars).

[5]

2. (a) 100 students are given a question to answer.
The time taken (t seconds) by each student is recorded and the results are shown in the table.

t	$0 < t \leq 20$	$20 < t \leq 30$	$30 < t \leq 35$	$35 < t \leq 40$	$40 < t \leq 50$	$50 < t \leq 60$	$60 < t \leq 80$
Frequency	10	10	15	28	22	7	8

- (i) Calculate an estimate of the mean time taken. [4]
- (ii) Two students are picked at random.
What is the probability that they both took more than 50 seconds?
Give your answer as a fraction in its lowest terms. [3]

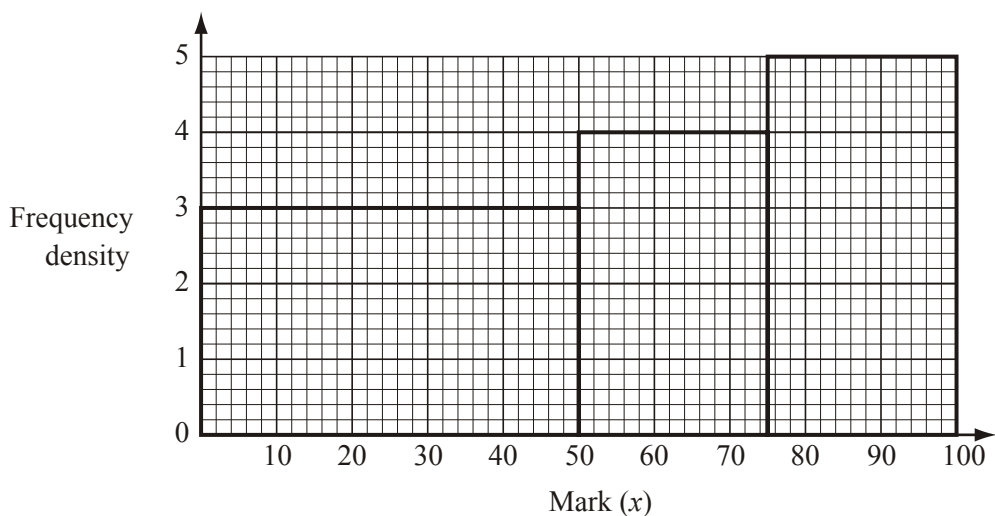
Answer part (b) on a sheet of graph paper.

- (b) The data in **part (a)** is re-grouped to give the following table.

t	$0 < t \leq 30$	$30 < t \leq 60$	$60 < t \leq 80$
Frequency	p	q	8

- (i) Write down the values of p and q . [2]
- (ii) Draw an accurate histogram to show these results.
Use a scale of 1 cm to represent 5 seconds on the horizontal time axis.
Use a scale of 1 cm to 0.2 units of frequency density (so that 1 cm² on your histogram represents 1 student). [4]

3. A group of students takes an English test.
The results are shown in the histogram.



100 students score marks in the range $50 < x \leq 75$.

- (i) How many students score marks in the range $0 < x \leq 50$? [1]
- (ii) How many students score marks in the range $75 < x \leq 100$? [1]
- (iii) Calculate an estimate of the mean mark of this group of students. [4]

4. The mass, m grams, of each of 200 chocolates is noted and the results are shown in the table.

Mass (m grams)	$10 < m \leq 20$	$20 < m \leq 22$	$22 < m \leq 24$	$24 < m \leq 30$
Frequency	35	115	26	24

- (i) Calculate an estimate of the mean mass of a chocolate. [4]
- (ii) On a histogram, the height of the column for the $20 < m \leq 22$ interval is 11.5 cm.
Calculate the heights of the other three columns.
Do not draw the histogram. [5]