A. **Review Problems**

1 All of the IB students in a school were asked how many minutes a day they studied mathematics. The results are given in the table.

Time spent studying mathematics (min)	$0 \le t < 15$	$15 \le t < 30$	$30 \le t < 45$	$45 \le t < 60$	$60 \le t < 75$	$75 \le t < 90$
Number of students	21	32	35	41	27	11

  a Is this data continuous or discrete?
  b Use your GDC to help you draw a fully labeled histogram to represent this data.

EXAM-STYLE QUESTION

2 The following table shows the age distribution of mathematics teachers who work at Caring High School.
  a Is the data discrete or continuous?
  b How many mathematics teachers work at Caring High School?
  c Use your GDC to help you draw a fully labeled histogram to represent this data.

Age	Number of teachers
$20 \le x < 30$	5
$30 \le x < 40$	4
$40 \le x < 50$	3
$50 \le x < 60$	2
$60 \le x < 70$	3

**2** Find the mode of each frequency table.

a

| Goals	Frequency
0	4
1	7
2	3
3	3
4	1

b

Height	Frequency
$140 \le h < 150$	6
$150 \le h < 160$	6
$160 \le h < 170$	5
$170 \le h < 180$	10
$180 \le h < 190$	8

4 The histogram on the right shows how many minutes it takes for students to return home after school.
  a Is the data discrete or continuous?
  b Represent the data in a grouped frequency table.
  c What is the shortest time that a student could take to get home?
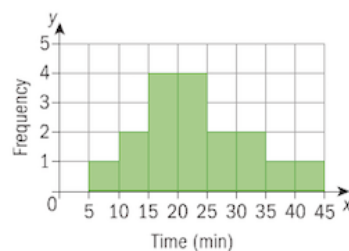
4 Use the box plot below to find **a** the range, **b** the median, **c** the lower quartile, **d** the upper quartile and **e** the interquartile range of the data.
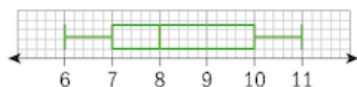
1 Find the modes of these sets of data.

a 7, 13, 18, 24, 9, 3, 18

b 8, 11, 9, 14, 9, 15, 18, 6, 9, 10

c 24, 15, 18, 20, 18, 22, 24, 26, 18, 26, 24

d −3, 4, 0, −2, 12, 0, 0, 3, 0, 5

e 2, 7, 4, 2, 1, 9, 3.5, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, 11

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3 The following histogram shows data about frozen chickens in a supermarket. The masses in kg are grouped such that $1 \leq w < 2$, $2 \leq w < 3$ and so on.

a Is the mass of frozen chickens discrete or continuous data?

b Draw the grouped frequency table for this histogram.

c How many frozen chickens are there in the supermarket?

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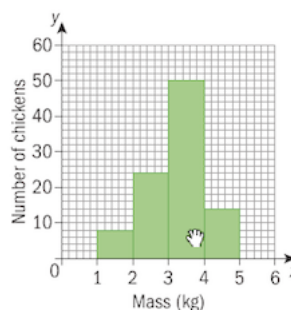
1 Find the mean driving speed for 6 different cars on the same road if their speeds are $66\,km\,h^{-1}$, $57\,km\,h^{-1}$, $71\,km\,h^{-1}$, $69\,km\,h^{-1}$, $58\,km\,h^{-1}$ and $54\,km\,h^{-1}$.

2 The price of buying music from different sites was seen as $1.79, $1.61, $1.96 and $2.08 per track. What was the mean price?

3 A computer repair service received the following number of calls per day over a period of 30 days.

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

a Is the data discrete or continuous?

b Construct a frequency table and find the mean number of calls per day.

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2 The table below shows the length of 40 flash drives in a computer store.

Show this data on a cumulative frequency diagram.

Length (mm)	f	Upper class boundary	Length (l mm)	Cumulative frequency
6–10	0	10.5	$l \leq 10.5$	0
11–15	2	15.5	$l \leq 15.5$	2
16–20	4	20.5	$l \leq 20.5$	6
21–25	8	25.5	$l \leq 25.5$	14
26–30	14	30.5	$l \leq 30.5$	28
31–35	6	35.5	$l \leq 35.5$	34
36–40	4	40.5	$l \leq 40.5$	38
41–45	2	45.5	$l \leq 45.5$	40

5 Kelly's test scores are 95, 82, 76 and 88. What score must she get on the fifth test in order to achieve an average of 84 on all five tests?

6 The mean mass of eleven players in a sports team is 80.3 kg. A new player joins the team and the mean goes up to 81.2 kg. Find the mass of the new player.

2 Su has been counting the number of tracks on the CDs in her collection. Find the median number of tracks on Su's CDs.

Number of tracks	7	8	9	10	11	12	13
Number of CDs	3	2	2	1	3	5	3

9 After 8 matches, a basketball player had a mean score of 27 points. After 3 more matches her average was 29. How many points did she score in the last 3 games?

10 Billy's mean sales price for 12 computers is $310 and Jean sold 13 with a mean of $320. Their boss tells them to combine their sales at the end of the week. What is the mean after Billy and Jean combine their sales?

4 A class of 30 IB mathematics students has the semester averages shown in the table.

| Marks	Frequency
$20 \leq m < 30$	2
$30 \leq m < 40$	3
$40 \leq m < 50$	5
$50 \leq m < 60$	7
$60 \leq m < 70$	6
$70 \leq m < 80$	4
$80 \leq m < 90$	2
$90 \leq m < 100$	1

a Construct a cumulative frequency table.
b Draw a cumulative frequency diagram.
c Use your graph to estimate
   i the median
   ii the upper and lower quartiles
   iii the interquartile range.

EXAM-STYLE QUESTIONS

7 The Onceonly family must drive an average of 250 km per day to complete their vacation on time. On the first five days, they travel 220 km, 300 km, 210 km, 275 km and 240 km. How many km must they travel on the sixth day in order to finish their vacation on time?

8 The mean of Tigger's last 8 rounds of golf is 71 shots. What is the total number of shots that he took in the 8 rounds?

1 The depths of snow at a ski resort are collected every year for 12 years on 31 January. All data is in centimetres.
30, 75, 125, 55, 60, 75, 65, 65, 45, 120, 70, 110.
Find **a** the range, **b** the median, **c** the lower quartile, **d** the upper quartile and **e** the interquartile range of the data set and show the data in a box and whisker plot.

1 The cumulative frequency plot shows the reach in cm of 100 boxers.
   a Estimate the median reach of a boxer.
   b What is the interquartile range?
   c What does the interquartile range tell you?
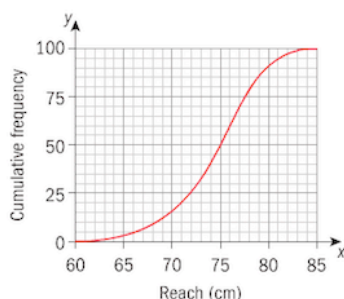
4 The table below shows the number of minutes of sunshine in the first 100 days of the year in Newtown.
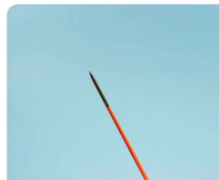
Minutes (m)	f
$0 \leq m < 30$	12
$30 \leq m < 60$	16
$60 \leq m < 90$	20
$90 \leq m < 120$	36
$120 \leq m < 150$	16

   a Is the data discrete or continuous?
   b What is the modal class?
   c Find the mean number of minutes of sunshine.

5 Forty students throw the javelin at the school sports day.
The results are shown below.

Distance (m)	$0 \leq d < 20$	$20 \leq d < 40$	$40 \leq d < 60$	$60 \leq d < 80$	$80 \leq d < 100$
Frequency	4	9	15	10	2

  a Construct a cumulative frequency table.
  b Draw a cumulative frequency diagram.
  c If the top 20% of the students are considered for the final,
      use your graph to estimate the qualifying distance.
  d Find the interquartile range.
  e Find the median distance thrown.

1 Find the median of the following.
  a 2, 3, 4, 5, 6, 7, 2, 3, 4   **b** 2, 5, 5, 2, 7, 3, 8
  c 9, 3, 4, 6, 7, 2, 3, 0
  d 8, 1, 2, 4, 5, 9, 12, 0, 4, 1.5, 8.4
  e 12, 4, 9, 1, 20, 7, 2, 5

3 a The table below shows the cumulative frequency
    distribution for the times taken by 100 students to eat lunch.

| Time (min)	Number of students
2 and under	0
4 and under	6
6 and under	18
8 and under	24
10 and under	40
12 and under	60
14 and under	78
16 and under	92
18 and under	100

  Using a scale of 1 cm for 10 students on the vertical axis and
  1 cm for 2 minutes on the horizontal axis, plot and draw a
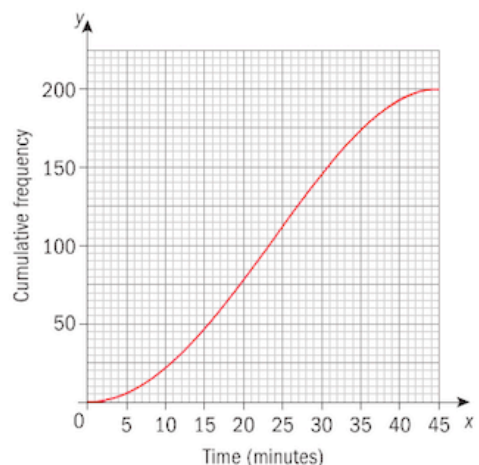 cumulative frequency diagram.
  Use your graph to estimate
  i the median   **ii** the interquartile range.
b The data in **a** can be represented in the form of the table
  below. Find the values of p and q.

Time	$2 \leq t < 8$	$8 \leq t < 12$	$12 \leq t < 16$	$16 \leq t < 20$
Frequency	24	36	p	q

5 Match each box plot with the correct histogram.

a

b

c

i

ii

iii
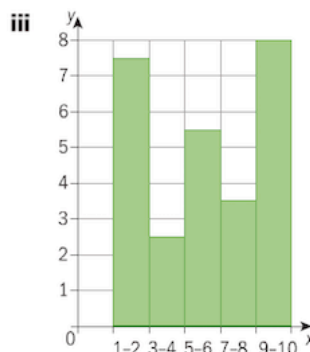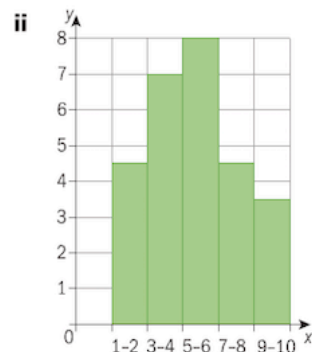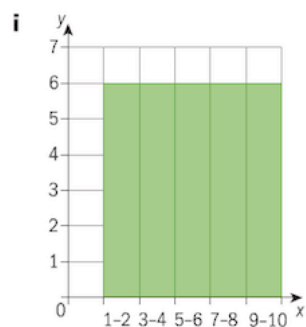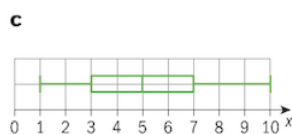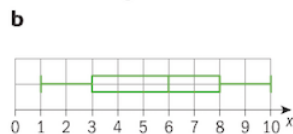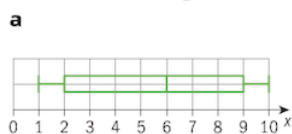
**6** The graph shows the time that students listen to music during school.

a Estimate
  i the median time that students listen to music
  ii the interquartile range
  iii the time a student must listen to music to be in the top 10%.
b The minimum listening time is zero and the maximum listening time is 45 minutes. Draw a box and whisker plot to represent this information.

2 Here are Albie's test scores for the year.

76 79 76 74 75 71 85 82 82 79 81

Find **a** the range, **b** the median, **c** the lower quartile,
d the upper quartile and **e** the interquartile range of the data set
of scores and show the data in a box and whisker plot.

3 Here are the temperatures in °C at a hill resort in Montana taken
every hour for eleven hours.

10, 11, 12, 14, 18, 22, 21, 25, 27, 28, 29.

Find **a** the range, **b** the median, **c** the lower quartile, **d** the upper
quartile and **e** the interquartile range of the data set.
Show the data in a box and whisker plot.

7 The cumulative frequency diagram below shows the heights
of 220 sunflowers.
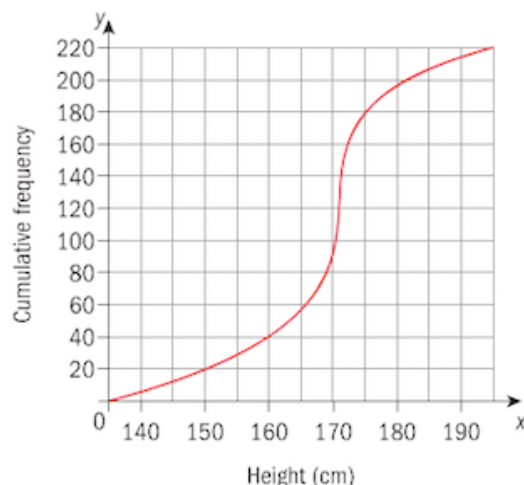
a Find the median height of a sunflower.
b The smallest 25% are sent to home garden shops. How many
go to those garden shops? Between what heights are they?
c The tallest 10% go to hotel displays. How many go to the
hotels? What is the smallest sunflower that goes to a hotel
display?
d The middle half of the sunflowers are sold immediately. How
many is this?
e The height of the tallest sunflower is 195 cm and the height
of the shortest is 136 cm. Draw a box and whisker plot to
represent the heights of the sunflowers.