1. A marine biologist records as a frequency distribution the lengths (L), measured to the nearest centimetre, of 100 mackerel. The results are given in the table below.

Length of mackerel (L cm)	Number of mackerel
$27 < L \leq 29$	2
$29 < L \leq 31$	4
$31 < L \leq 33$	8
$33 < L \leq 35$	21
$35 < L \leq 37$	30
$37 < L \leq 39$	18
$39 < L \leq 41$	12
$41 < L \leq 43$	5
	100

(a) Construct a cumulative frequency table for the data in the table.

(2)

(b) Draw a cumulative frequency curve.

Hint: Plot your cumulative frequencies at the top of each interval.

(3)

(c) Use the cumulative frequency curve to find an estimate, to the nearest cm for

(i) the median length of mackerel;

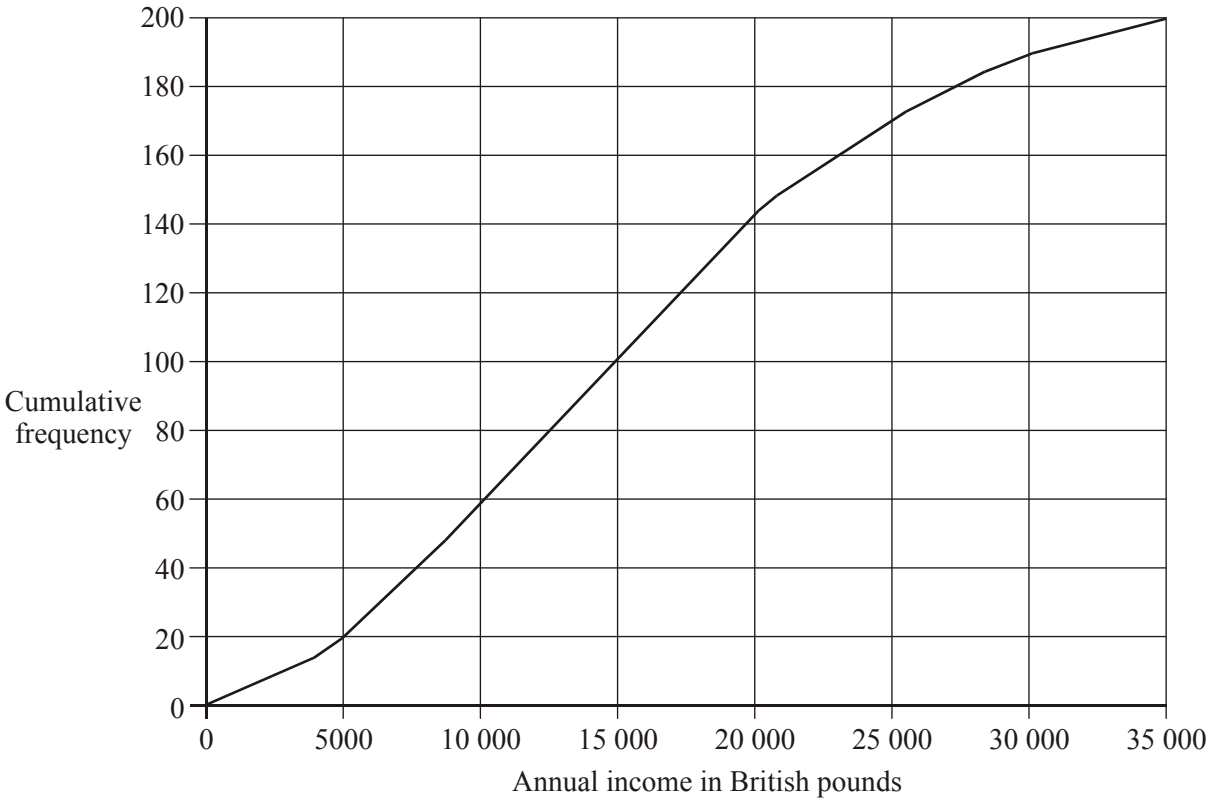
(2)

(ii) the interquartile range of mackerel length.

(2)

(Total 9 marks)

2. The graph below shows the cumulative frequency for the yearly incomes of 200 people.



Use the graph to estimate

(a) the number of people who earn less than 5000 British pounds per year;

(b) the median salary of the group of 200 people;

(c) the lowest income of the richest 20% of this group.

Working:

Answers:

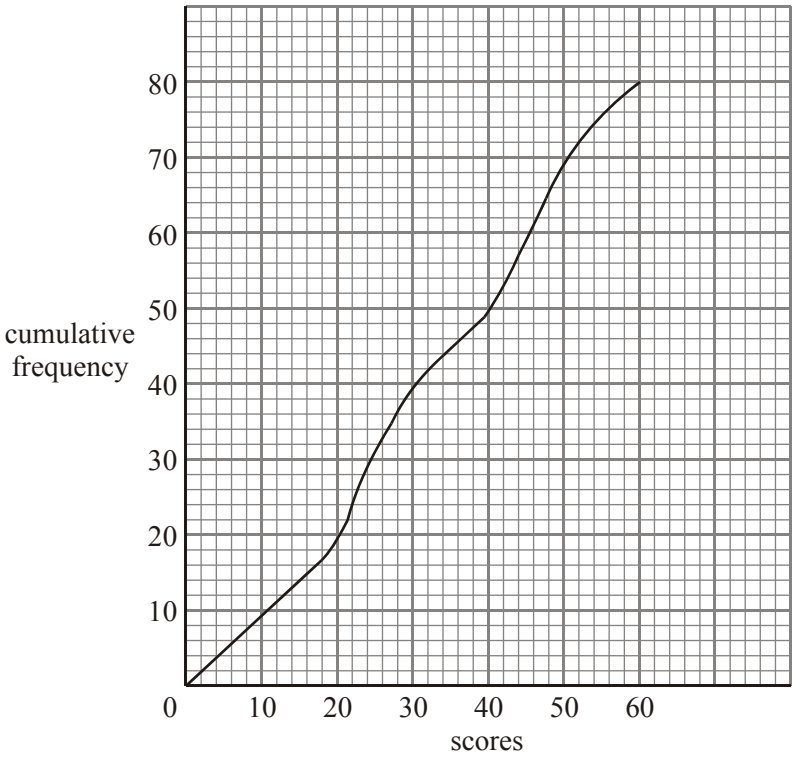
(a) .....

(b) .....

(c) .....

(Total 4 marks)

3. The cumulative frequency graph below shows the examination scores of 80 students.



From the graph find

(a) the median value;

(b) the interquartile range;

(c) the 35^{th} percentile;

(d) the percentage of students who scored 50 or above on this examination.

Working:

Answers:

(a) .....

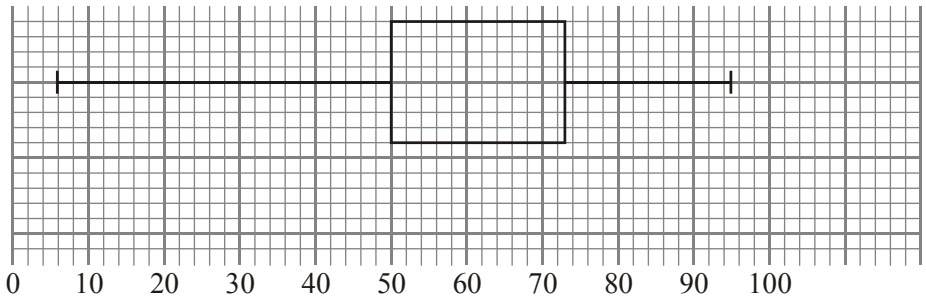
(b) .....

(c) .....

(d) .....

(Total 8 marks)

4. (a) The exam results for 100 boys are displayed in the following diagram:

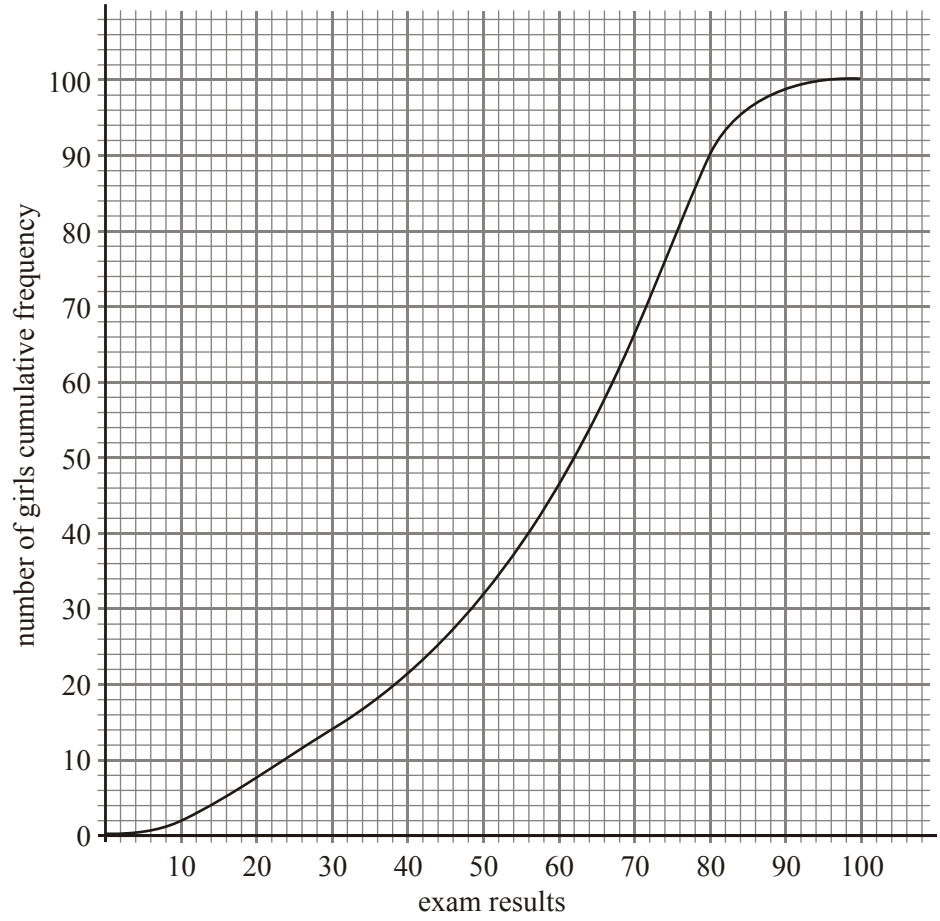


(i) Find the range of the results.

(ii) Find the interquartile range.

(iii) Write down the median.

(b) The exam results for 100 girls are displayed in the diagram below:



(i) Write down the median.

(ii) Find the inter quartile range.

(c) Write down the set of results that are the most spread out and give a reason for your answer.

(Total 6 marks)

5. (a) State which of the following sets of data are discrete.

(i) Speeds of cars travelling along a road.

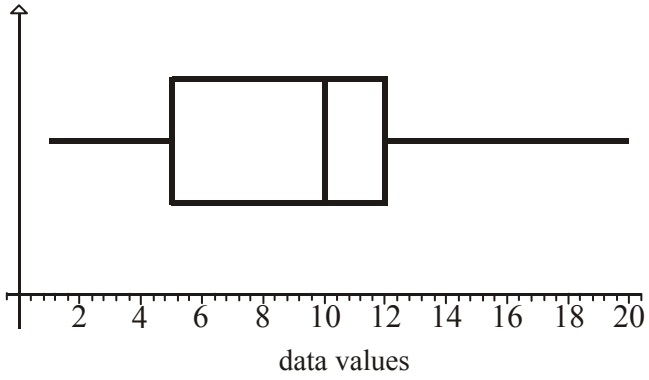
(ii) Numbers of members in families.

(iii) Maximum daily temperatures.

(iv) Heights of people in a class measured to the nearest cm.

(v) Daily intake of protein by members of a sporting team.

The boxplot below shows the statistics for a set of data.



(b) For this data set write down the value of

(i) the median;

(ii) the upper quartile;

(iii) the minimum value present.

(c) Write down three different integers whose mean is 10.

Working:

Answers:

(a) .....

(b) (i).....

(ii).....

(iii).....

(c) .....

(Total 6 marks)

1. (a)

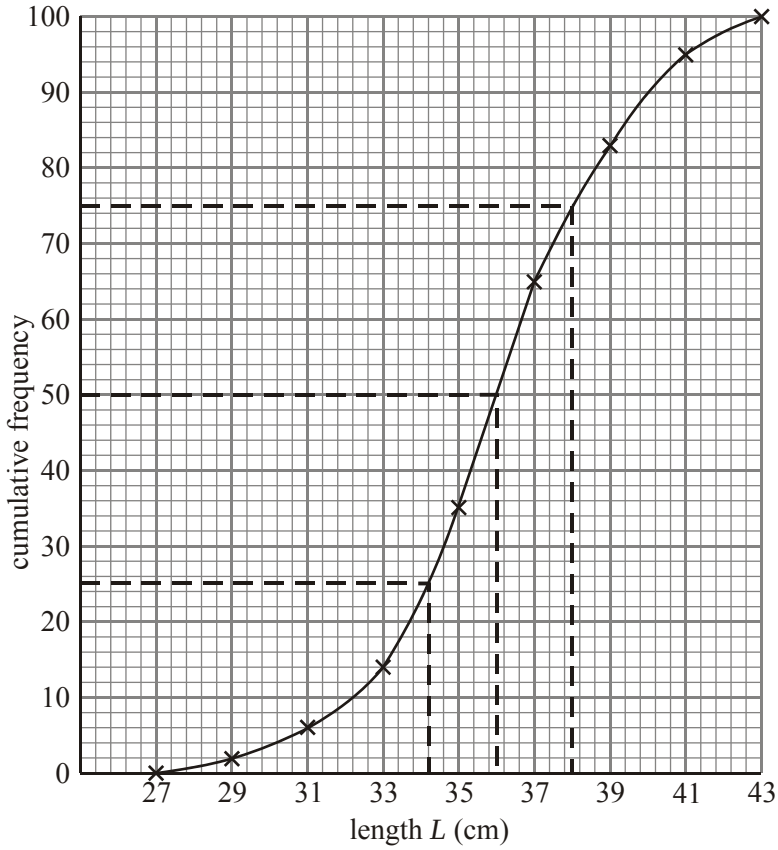
L (cm)	f	Σf
≤ 29	2	2
≤ 31	4	6

≤ 33	8	14
≤ 35	21	35
≤ 37	30	65
≤ 39	18	83
≤ 41	12	95
≤ 43	5	100

(A2) 2

Notes: *Award (Al) for four correct entries in the column headed* Σf.
Award (A2) for all 8 correct.

(b)



(A3) 3

Notes: *Award (Al) for both axes and correct scale.*
Award [½ mark] for each correctly plotted point and round up to a maximum of [2 marks].

(c) (i) Median length of mackerel = 36 cm ± 0.2 cm (M1)
= 36 cm (A1)

(ii) Interquartile range of mackerel length = 3.8 ± 0.2 cm (M1)
= 4 cm (A1) 4*

**(read from candidate's curve)*

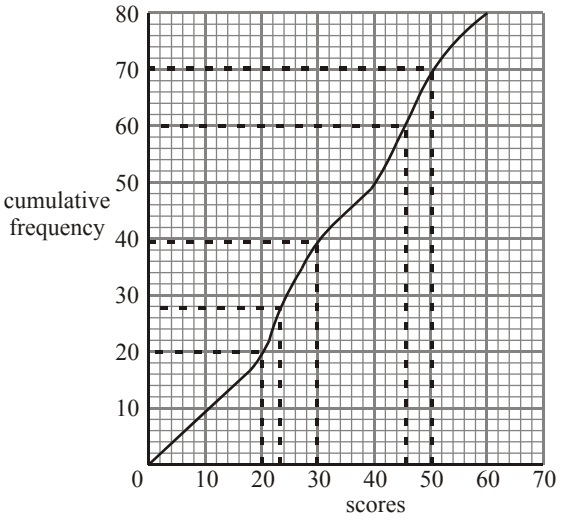
[9]

2. (a) 19 or 20 people (A1)

(b) Median salary = 15000 GBP (A1)

(c) 80% of 200
= 160
23000 ± 500 (M1)
(A1)
[4]

3.



(a) 30 (A2)(C2)

(b) $P_{75} = 46$, $P_{25} = 20$ (M1)
$46 - 20 = 26$ (A1)(C2)

(c) $0.35(80) = 28$, $P_{35} = 23$ (A2)(C2)

(d) $\frac{10}{80} = 12.5\%$ (A2)(C2)

Note: *Allow ±2 for each measurement.*

Note: *Allow ft for (b), (c) and (d) if percentile scores were figured on the basis of 100 instead of 80.*

[8]

4. (a) (i) $95 - 6 = 89$ (A1)

(ii) $73 - 50 = 23$ (A1)

(iii) 60 (A1) (C3)

(b) (i) 62 (A1)

(ii) $73 - 43 = 30$ (A1) (C2)

(c) The girls as the IQR is larger (R1) (C1)

[6]

5. (a) (ii) and (iv) are discrete. (A1)(A1) (C2)

Notes: *Award* (A1)(A0) *for both correct and one incorrect.*

Award (A1)(A0) *for one correct and two incorrect.*

Otherwise, (A0)(A0)**.**

(b) (i) Median = 10 (A1)

(ii) $Q_3 = 12$ (A1)

(iii) Min value = 1(±0.2) (A1) (C3)

(c) Any three different **integers** whose mean is 10 eg 9, 10, 11. (A1) (C1)

[6]