3 MUST KNOW QUESTIONS TO *CONQUER*

STATISTICS

1

(a) A farmer fed 15 new-born duck with a new variety of grain.
The stem-and-leaf diagram shows the weight gains of the duck after three weeks.

37	8			
38	1	9		
39	0	5	6	
40	2	3	7	9
41	8	9		
42	5	7		
43	9			

Key 37 | 8 means 378 grams

(i) Find the median weight gain.
(ii) Find the lower quartile
(iii) Find the upper quartile
(iv) Find the interquartile range.

Calculate
(b) the mean of the weight gain,
(c)the standard deviation.17

Ducks fed on the standard variety of grain had weight gains after three weeks.
The mean of these weight gains was 392 grams while the standard deviation was 12 grams.
(d)State briefly how the new variety of grain compares to the standard variety.

Ans: (i) 403 (ii) 390 (iii) 419 (iv) 29 (b) 405.2 (c) 17.1 (d) Ducks had more weight gain when fed with the new variety of grain. The weight gain from the new variety of grain shows more spread & less consistent results.

2

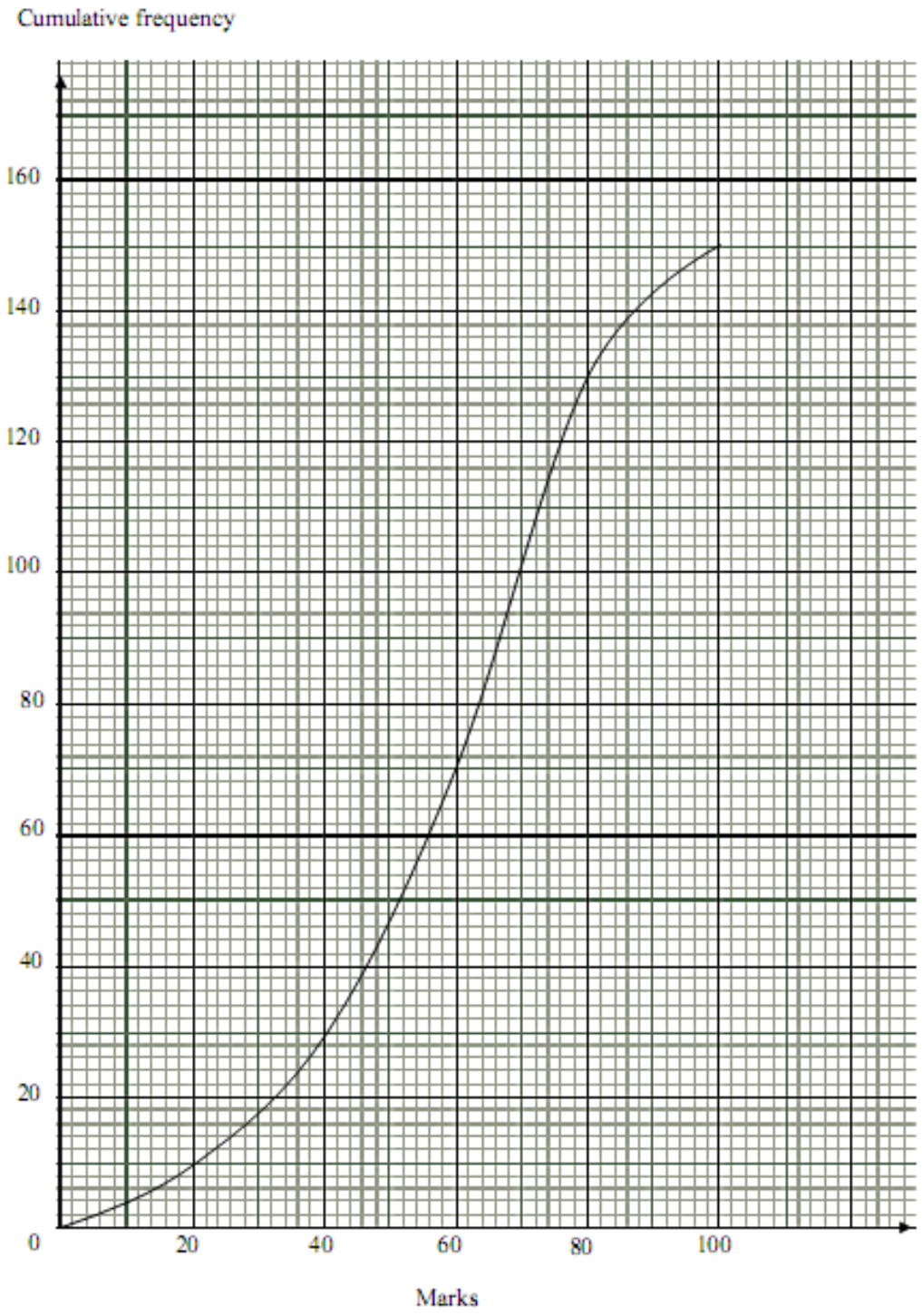
The table below shows the number of fishes kept by students.

Number of fishes	0	1	2	3	4
Number of students	10	12	x	2	3

(a) If the mean is 1.25, find the value of x.
(b) If the median is 1, find possible range of x
(c) If the mode is 1, find the highest possible value of x.

Ans: $x = 5$, (b) $0 \leq x \leq 17$, (c) 11

3 The cumulative frequency graph shows the distribution of marks of 150 students in a Mathematics examination.



(a) Use the graph to estimate
(i) The number of students who score more than 36 marks,
(ii) The interquartile range.

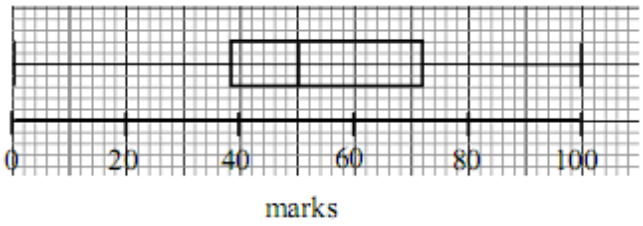
(b) Two students are selected at random. Find the probability that
(i) Both students score more than 36 marks,
(ii) One student scores at most 64 marks while the other student scores more than 80 marks.

(c)
(i) Copy and complete the grouped frequency table of the marks of the 150 students.

x (marks)	$0 < x \leq 20$	$20 < x \leq 40$	$40 < x \leq 60$	$60 < x \leq 80$	$80 < x \leq 100$
No. of students					

(ii) Using your grouped frequency table, calculate an estimate of
(a) The mean mark,
(b) The standard deviation.

(d) The same group of students took a Science examination.
The box and whisker plot shows the distribution of their marks.



(i) Which examination was more difficult? Justify your answer.
(ii) Compare and comment on the consistency of the performances of the students in the two examinations.

(e) Another set of 150 students have a higher median but a smaller standard for a Science Examination. Describe how the cumulative frequency curve will be different from the given curve.

(f) It was discovered that the marks have been incorrectly measured. The actual mark is 5 marks more than what was recorded. Explain how the median and interquartile range of the recorded marks are affected by this error.

(a) (i) 126 students

(ii) 73 – 45 = 28 marks

(b) (i) $\frac{105}{149}$

(ii) $\frac{82}{150} \times \frac{20}{149} \times 2 = \frac{328}{2235}$

(c) (i)

x (marks)	$0 < x \leq 20$	$20 < x \leq 40$	$40 < x \leq 60$	$60 < x \leq 80$	$80 < x \leq 100$
No of students	10	20	40 or 41	60 or 69	20

(ii) (a) 58 marks

(ii) (b) 21.7 marks

(d) (i) Science examination is more difficult as it has a lower median mark.

(ii) The interquartile range for the Science examination is larger. Hence the performance for Science examination is less consistent.

(e) Cumulative frequency will shift to the right side and it will be gentler as compared to the cumulative frequency of the Math Exam

(f) Median will increase by 5 marks but the Interquartile Range will remain the same.