La Scuola / Huson / IB Mathematics Name:
12 January 2026

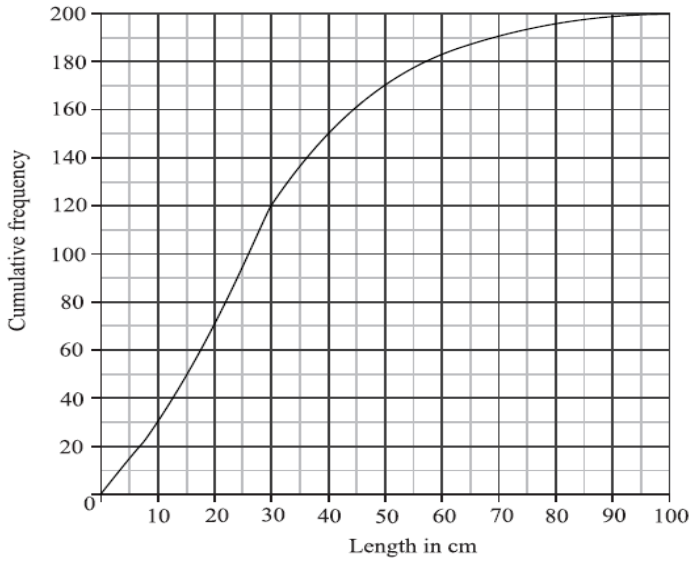
4.7 Classwork: Cumulative distributions

1a. A fisherman catches 200 fish to sell. He measures the lengths, l cm of these fish, and the results are shown in the frequency table below.

Length l cm	$0 \le l < 10$	$10 \le l < 20$	$20 \le l < 30$	$30 \le l < 40$	$40 \le l < 60$	$60 \le l < 75$	$75 \le l < 100$
Frequency	30	40	50	30	33	11	6

Calculate an estimate for the standard deviation of the lengths of the fish. *[3 marks]*

1b. A cumulative frequency diagram is given below for the lengths of the fish.



Use the graph to answer the following. *[6 marks]*

(i) Estimate the interquartile range.

(ii) Given that 40% of the fish have a length more than k cm, find the value of k.

1c. In order to sell the fish, the fisherman classifies them as small, medium or large.

Small fish have a length less than $20\ \text{cm}$.

Medium fish have a length greater than or equal to $20\ \text{cm}$ but less than $60\ \text{cm}$.

Large fish have a length greater than or equal to $60\ \text{cm}$.

Write down the probability that a fish is small. *[2 marks]*

1d. The cost of a small fish is $\$4$, a medium fish $\$10$, and a large fish $\$12$.

Complete the following table, which gives a probability distribution for the cost $\$X$.

Cost \$X	4	10	12
$\text{P}(X = x)$		0.565	

[2 marks]

1e. Find $\text{E}(X)$. *[2 marks]*