**Histograms Basics (Unequal Class Intervals)** www.m4ths.com

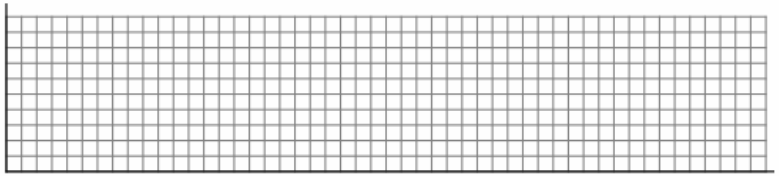
$$Frequency\ Density = \frac{Frequency}{Class\ Width}$$

$$Frequency = Frequency\ Density \times Class\ Width$$

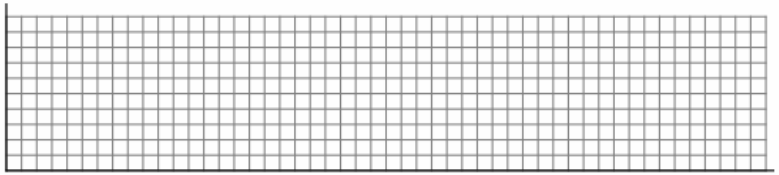
## Section 1 – Constructing Histograms

(1) Complete each table below and construct a **fully labelled** histogram to represent the data.

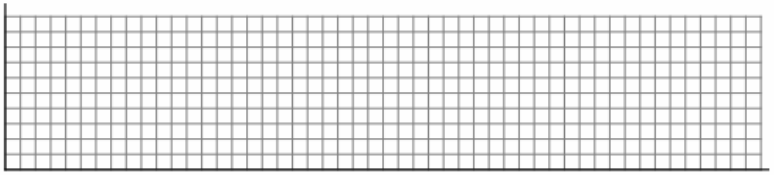
| Length of Slugs (mm) | Frequency | Frequency Density | Calculation |
|---|---|---|---|
| $0 < l \leq 5$ | 10 | 2 | 10 ÷ 5 |
| $5 < l \leq 15$ | 40 | | |
| $15 < l \leq 25$ | 25 | | |
| $25 < l \leq 40$ | 9 | | |
| $40 < l \leq 50$ | 35 | | |



| Height of Plants (cm) | Frequency | Frequency Density |
|---|---|---|
| $0 < h \leq 6$ | 15 | |
| $6 < h \leq 9$ | 6 | |
| $9 < h \leq 17$ | 14 | |
| $17 < h \leq 20$ | 3 | |
| $20 < h \leq 25$ | 10 | |



| Length of Mice tails (cm) | Frequency | Frequency Density |
|---|---|---|
| $0 < l \leq 3$ | | 5 |
| $3 < l \leq \_\_$ | 10 | 2 |
| $\_\_ < l \leq 10$ | 6 | |

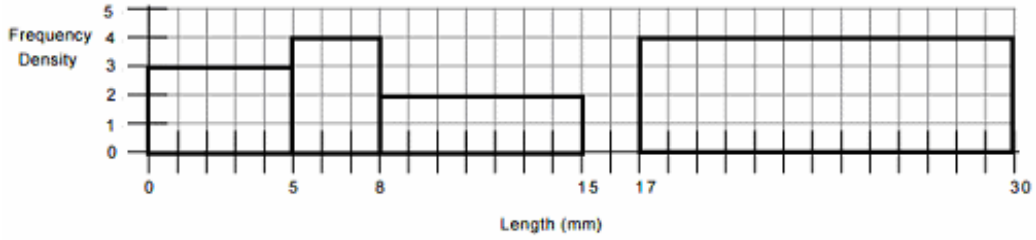


## Section 2 – Cumulative Frequency, Box Plots and Frequency Polygons

(1) Using each example in Section 1, for each data set:
(a) Make a cumulative frequency table (You can add a column to the ones on the right!).
(b) Draw a cumulative frequency curve and frequency polygon to represent the data.
(c) Estimate the lower quartile, median, upper quartile and Inter Quartile Range (IQR).

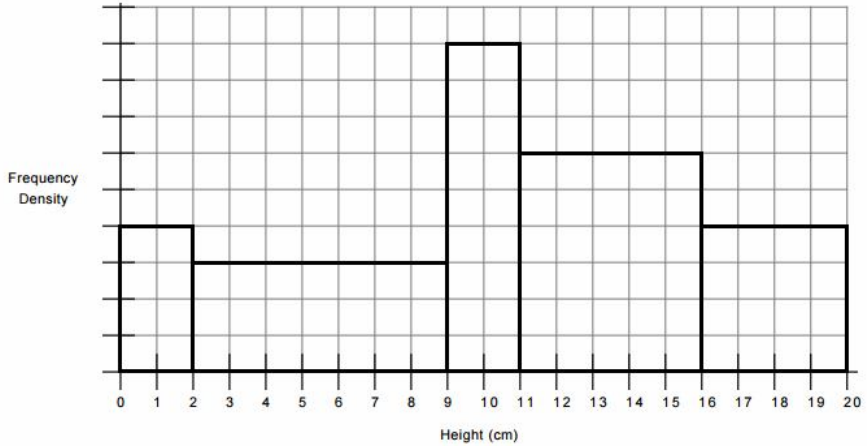
## Section 3 – Interpreting Histograms

(1) The histogram below shows information about the length of plant shoots on some plants.




(a) Explain how you **could** tell that there were 15 shoots measuring 5mm or less.
(b) How many shoots were between 5 and 8mm?
(c) Given that there were 6 shoots between 15 and 17mm, complete the histogram.
(d) Find the total number of shoots in the experiment.
(e) One shoot is taken at random. Find the probability that the shoot is (i) Less that 5mm, (ii) Less than 8mm, (iii) More than 15mm & (iv) More than 30mm.

(2) The histogram below shows the heights of plants growing in a garden.




Given that 8 plants were no more than 20**mm** high, the smallest plant was 5mm and the largest plant was 190mm:
(a) Complete the histogram.
(b) Find the total number of plants in the garden.
(c) Draw a cumulative frequency curve and box plot to represent the data.
(d) Estimate the lower quartile, median, upper quartile and Inter Quartile Range (IQR).
(e) Find an estimate for the percentage of plants taller than 10cm.
(f) If one plant is taken at random, find the probability that it's less than 16cm tall.