

Edexcel GCSE

Mathematics (Linear) – 1MA0

HISTOGRAMS

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.

Tracing paper may be used.

Items included with question papers

Nil

Instructions

Use black ink or ball-point pen.

Fill in the boxes at the top of this page with your name, centre number and candidate number.

Answer all questions.

Answer the questions in the spaces provided – there may be more space than you need.

Calculators may be used.

Information

The marks for each question are shown in brackets – use this as a guide as to how much time to spend on **each** question.

Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

Advice

Read each question carefully before you start to answer it.

Keep an eye on the time.

Try to answer every question.

Check your answers if you have time at the end.

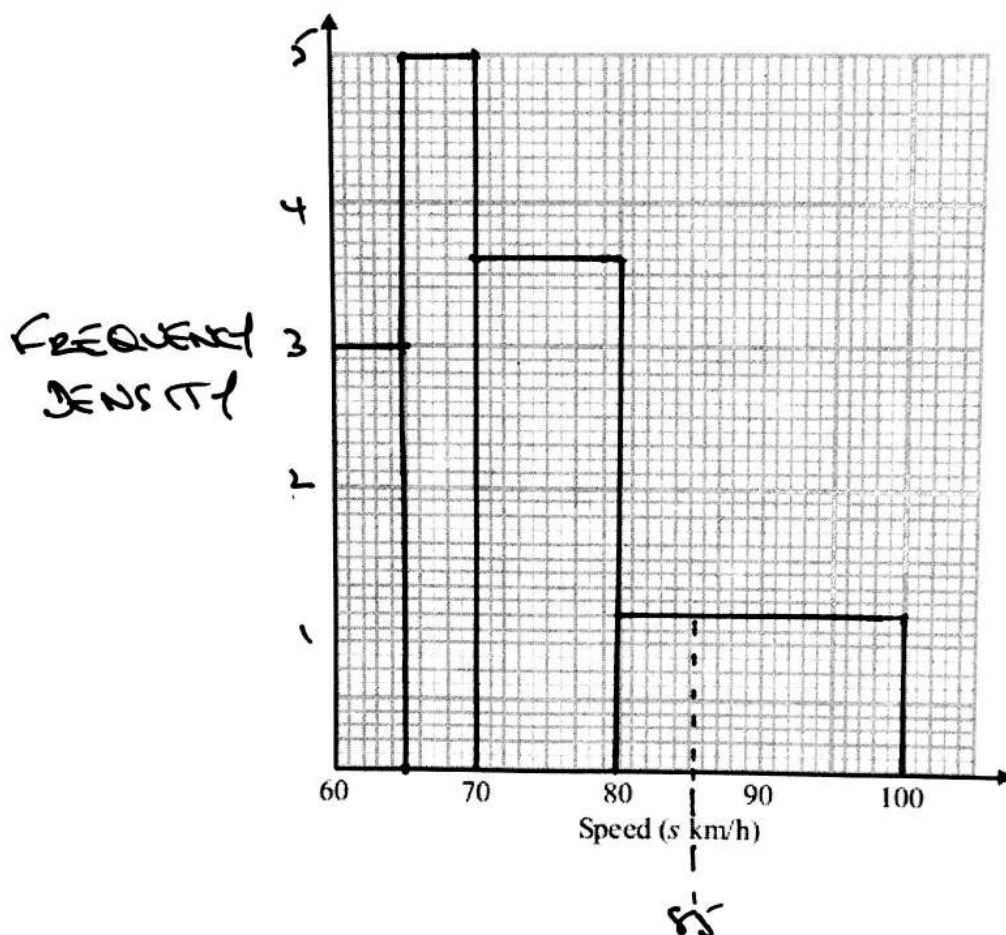
$$\text{FREQUENCY DENSITY} = \frac{\text{FREQ}}{\text{CLASS WIDTH}}$$

1. The table gives some information about the speeds, in km/h, of 100 cars.

Speed (s km/h)	Frequency
$60 < s \leq 65$	15
$65 < s \leq 70$	25
$70 < s \leq 80$	36
$80 < s \leq 100$	24

$$\begin{aligned} \text{FD} \\ 15 \div 5 &= 3 \\ 25 \div 5 &= 5 \\ 36 \div 10 &= 3.6 \\ 24 \div 20 &= 1.2 \end{aligned}$$

- (a) On the grid, draw a histogram for the information in the table.



- (b) Work out an estimate for the number of cars with a speed of more than 85 km/h.

$$\text{Freq Den} = \frac{\text{Freq}}{\text{Class width}}$$

$$1.2 = \frac{\text{Freq}}{15}$$

$$18 = \text{Freq}$$

$$\dots\dots\dots 18 \text{ cars} \quad (2)$$

(5 marks)

$$\text{Freq Den} = \frac{\text{Freq}}{\text{class width}}$$

2. The table gives information about the heights, h metres, of trees in a wood.

Height (h metres)	Frequency
$0 < h \leq 2$	7
$2 < h \leq 4$	14
$4 < h \leq 8$	18
$8 < h \leq 16$	24
$16 < h \leq 20$	10

FD

$$7 \div 2 = 3.5$$

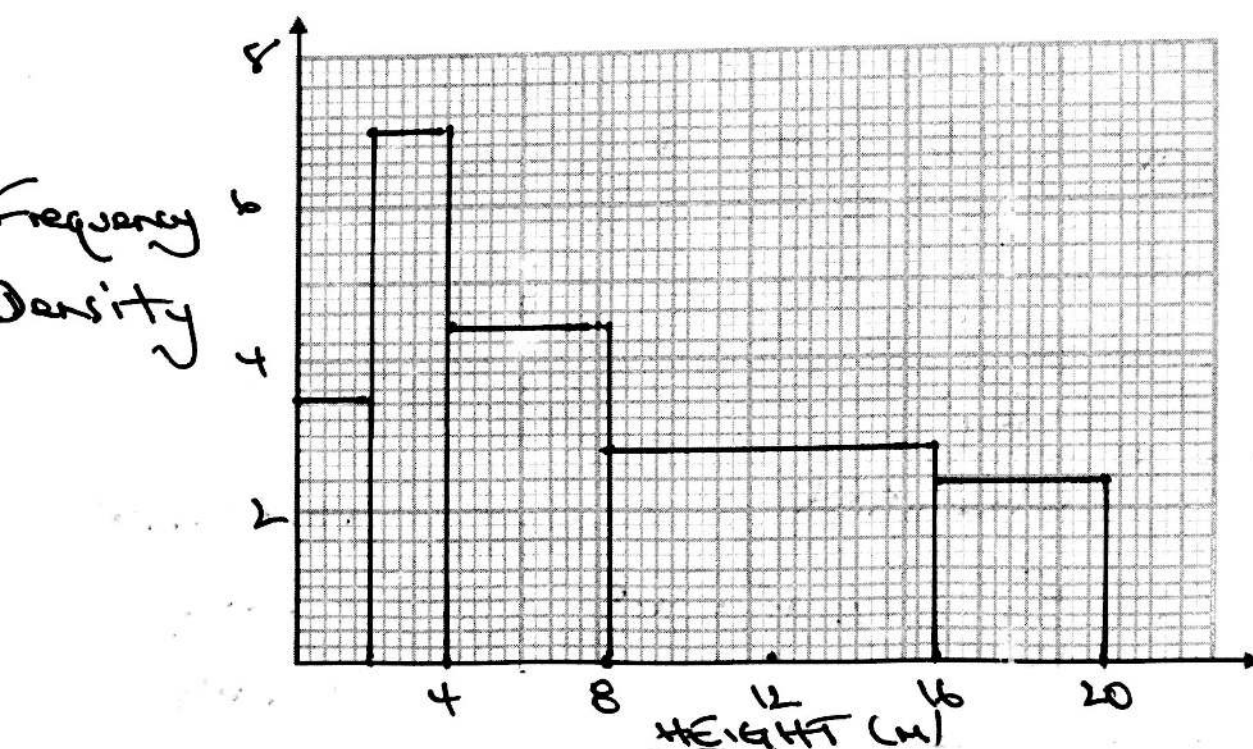
$$14 \div 2 = 7$$

$$18 \div 4 = 4.5$$

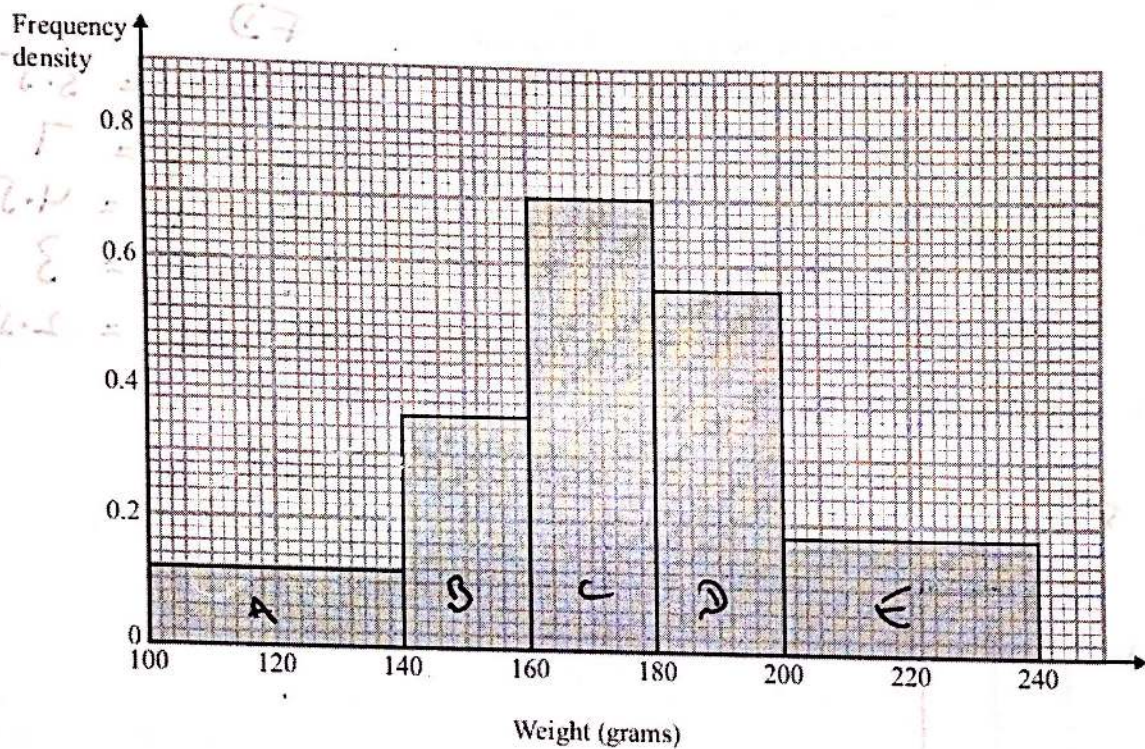
$$24 \div 8 = 3$$

$$10 \div 4 = 2.5$$

Draw a histogram to show this information.



3. The histogram shows some information about the weights of a sample of apples.



Work out the proportion of apples in the sample with a weight between 140 grams and 200 grams.

$$\text{Freq Den} = \frac{\text{Freq}}{\text{Class width}}$$

$$A \quad 0.12 = \frac{F}{40} \quad \therefore F = 4.8$$

$$B \quad 0.36 = \frac{F}{20} \quad \therefore F = 7.2$$

$$C \quad 0.7 = \frac{F}{20} \quad \therefore F = 14.0$$

$$D \quad 0.54 = \frac{F}{40} \quad \therefore F = 21.6$$

$$E \quad 0.18 = \frac{F}{40} \quad \therefore F = 7.2$$

TOTAL 44.4

PROPORTION

$$\frac{32.4}{44.4}$$

$$= 0.72972$$

$$= \underline{\underline{73\%}}$$

(4 marks)

$$\text{Freq Den} = \frac{\text{Freq}}{\text{Class width}}$$

4. The table shows information about the lengths of time, t minutes, it took some students to do their maths homework last week.

Time (t minutes)	Frequency
$0 < t \leq 10$	4
$10 < t \leq 15$	8
$15 < t \leq 20$	24
$20 < t \leq 30$	16
$30 < t \leq 50$	5

FD

$$4 \div 10 = 0.4$$

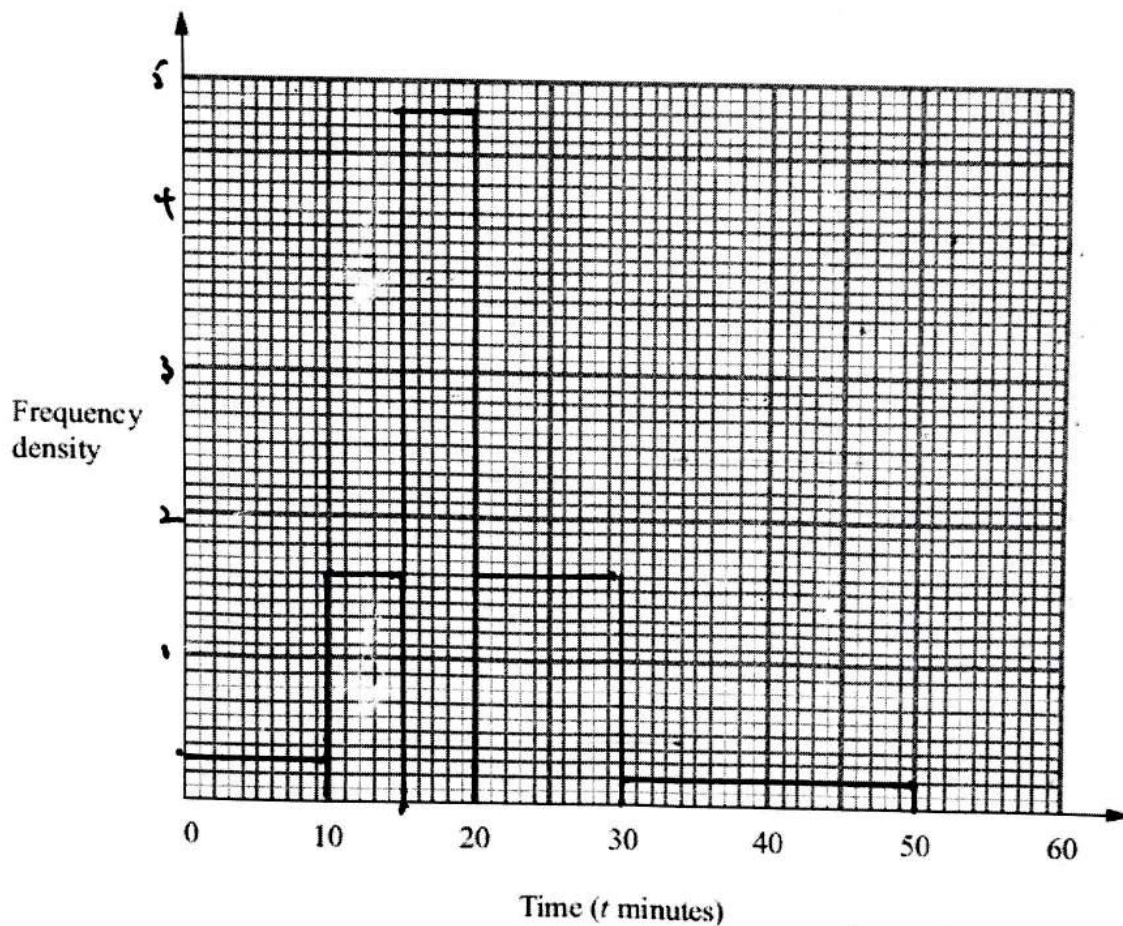
$$8 \div 5 = 1.6$$

$$24 \div 5 = 4.8$$

$$16 \div 10 = 1.6$$

$$5 \div 20 = 0.25$$

Draw a histogram for this information.



(Total 3 marks)

$$\frac{\text{Freq Dan}}{\text{Class width}} = \frac{\text{Freq}}{\text{Class width}}$$

5. The table shows information about the total times that 35 students spent using their mobile phones one week.

Time (h hours)	Frequency
$0 \leq h < \frac{1}{2}$	8
$\frac{1}{2} \leq h < 1$	7
$1 \leq h < 2$	11
$2 \leq h < 4$	9

FD

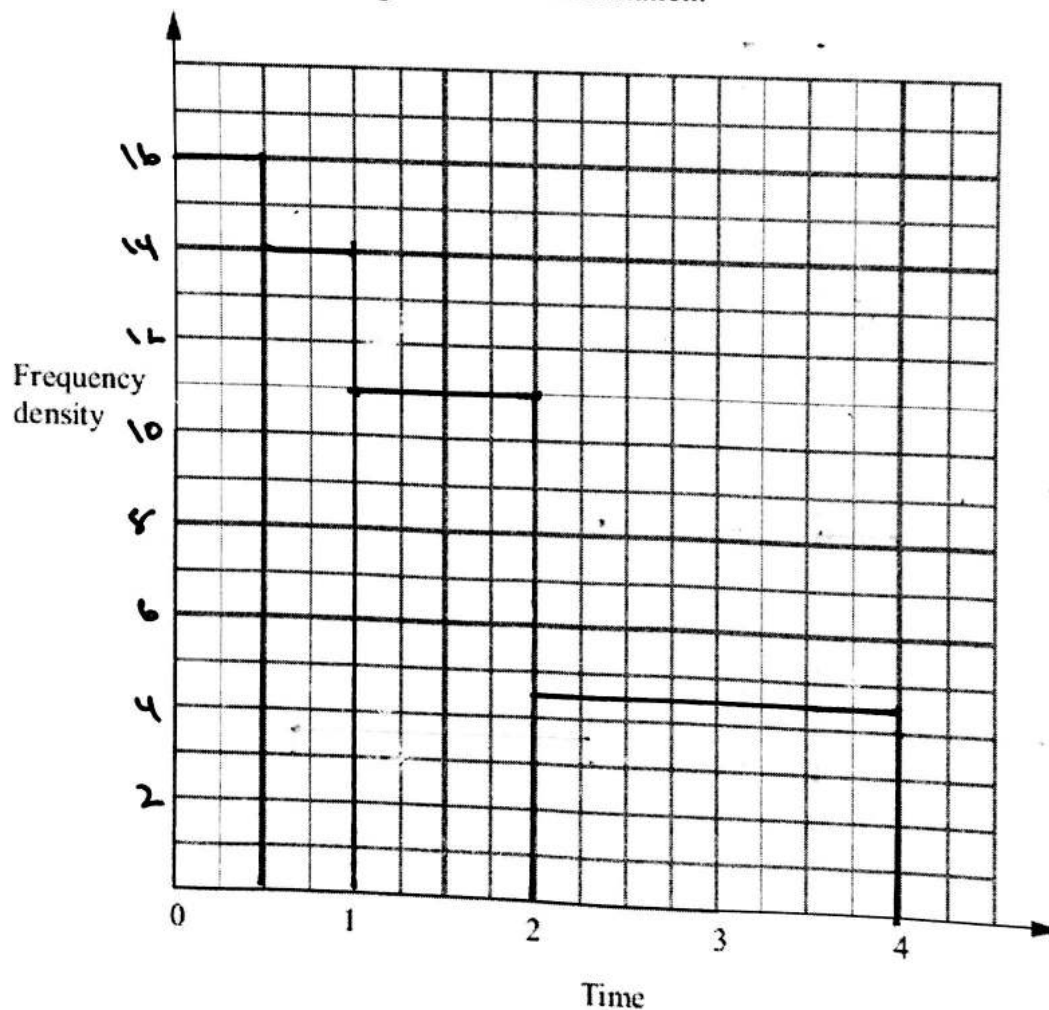
$$8 \div \frac{1}{2} = 16$$

$$7 \div \frac{1}{2} = 14$$

$$11 \div 1 = 11$$

$$9 \div 2 = 4.5$$

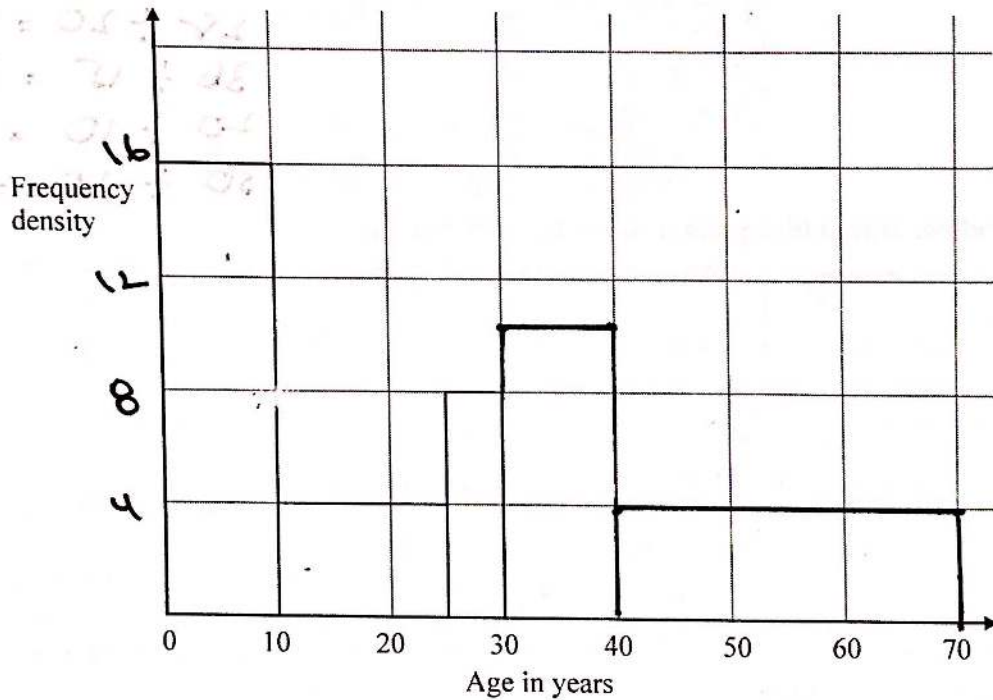
On the grid below, draw a histogram for this information.



(Total for Question 23 = 3 marks)

$$\text{Freq Den} = \frac{\text{Freq}}{\text{Class width}}$$

6. The incomplete table and histogram give some information about the ages of the people who live in a village.



- (a) Use the information in the histogram to complete the frequency table below.

Age (x) in years	Frequency
$0 < x \leq 10$	160
$10 < x \leq 25$	$15 \times 4 = 60$
$25 < x \leq 30$	$5 \times 8 = 40$
$30 < x \leq 40$	100
$40 < x \leq 70$	120

$$FD \quad 160 \div 10 = 16$$

$$100 \div 10 = 10$$

$$120 \div 30 = 4$$

(2)

- (b) Complete the histogram.

(2)

(Total 4 marks)

$$\text{Freq Den} = \frac{\text{Freq}}{\text{Class width}}$$

7. The table shows the distribution of the ages of passengers travelling on a plane from London to Belfast.

Age (x years)	Frequency
$0 < x \leq 20$	28
$20 < x \leq 35$	36
$35 < x \leq 45$	20
$45 < x \leq 65$	30

FD

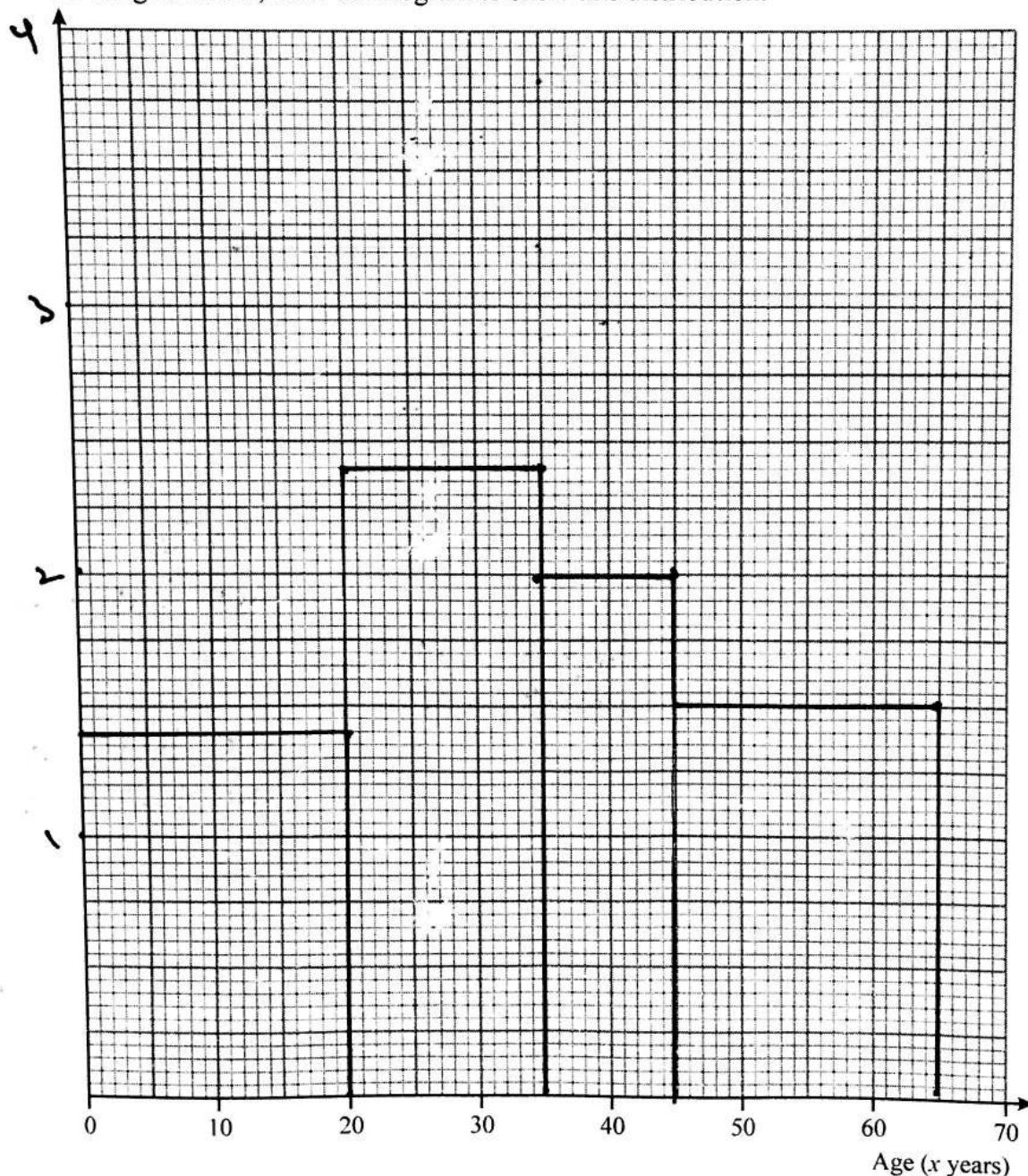
$$28 \div 20 = 1.4$$

$$36 \div 15 = 2.4$$

$$20 \div 10 = 2$$

$$30 \div 20 = 1.5$$

On the grid below, draw a histogram to show this distribution.



(Total 3 marks)