



**eClassroom**

GCSE Mathematics

# Histograms

**Worked Solutions**

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Pearson Edexcel GCSE & iGCSE Mathematics



## Section A — Foundation — Worked Solutions

### [Fluency] Question 1

Frequency = FD  $\times$  class width

0-10:  $2.0 \times 10 = 20$ , 10-20:  $3.5 \times 10 = 35$ , 20-30:  $4.0 \times 10 = 40$ , 30-50:  $1.5 \times 20 = 30$

$\therefore$  **20, 35, 40, 30**

### [Fluency] Question 2

FD = freq  $\div$  class width

0-10:  $20 \div 10 = 2.0$ , 10-20:  $35 \div 10 = 3.5$ , 20-30:  $40 \div 10 = 4.0$ , 30-50:  $30 \div 20 = 1.5$

(b) Bars drawn at correct heights with no gaps, y-axis labelled 'Frequency Density'

$\therefore$  **FDs: 2.0, 3.5, 4.0, 1.5**

### [Reasoning] Question 3

15-20 :  $3.5 \times 5 = 17.5$

20-25 :  $4.0 \times 5 = 20$

Total =  $17.5 + 20 = 37.5 \approx 38$

$\therefore$   **$\approx 38$  people**

### [Reasoning] Question 4

FD = freq  $\div$  width: 0-10: 1.5, 10-20: 2.5, 20-40: 3.0, 40-60: 2.0, 60-80: 1.0

(b) Draw bars at these heights with no gaps

$\therefore$  **FDs: 1.5, 2.5, 3.0, 2.0, 1.0**

### [Reasoning] Question 5

Freqs: 0-10:  $1.5 \times 10 = 15$ , 10-20:  $3.0 \times 10 = 30$ , 20-40:  $2.5 \times 20 = 50$ , 40-60:  $1.0 \times 20 = 20$

(b) Total =  $15 + 30 + 50 + 20 = 115$

(c) Modal class = 20-40 (highest FD = 2.5)

$\therefore$  **(a) 15, 30, 50, 20 (b) 115 (c) 20-40**

### [Problem Solving] Question 6

(a) Freq = FD  $\times$  width =  $4.5 \times 10 = 45$

(b) FD = freq  $\div$  width =  $18 \div 30 = 0.6$

$\therefore$  **(a) 45 people (b) 0.6**





## Section B — Higher — Worked Solutions

### [Fluency] Question 1

Freqs:  $0-5:4 \times 5=20$ ,  $5-15:2 \times 10=20$ ,  $15-20:6 \times 5=30$ ,  $20-35:3 \times 15=45$ ,  $35-50:1 \times 15=15$

(b)  $\text{Total}=20+20+30+45+15=130$

$\therefore$  (a) **20,20,30,45,15** (b) **130**

### [Reasoning] Question 2

Visible:  $0-10:2 \times 10=20$ ,  $20-30:4 \times 10=40$ ,  $30-50:1.5 \times 20=30$ . Visible total=90

Missing  $(10-20) = 200-20-40-30=110$ .  $\text{FD}=110 \div 10=11$

(b) Draw bar at  $\text{FD}=11$  for 10-20

$\therefore$  **Missing freq=110, FD=11**

### [Reasoning] Question 3

(a) FDs: 2.0,3.5,4.0,1.5. Draw histogram.

Total=125. Median at 62.5th. CF: 20,55,95,125  $\rightarrow$  62.5th in 20-30

(b)  $\text{Median} \approx 20 + \frac{62.5 - 55}{40} \times 10 \approx 21.9$

$\therefore$  (b) **Median  $\approx$  21.9 min**

### [Problem Solving] Question 4

Freqs:  $0-15:2 \times 15=30$ ,  $15-30:5 \times 15=75$ ,  $30-45:4 \times 15=60$ ,  $45-60:1 \times 15=15$ . Total=180

(b)  $\text{Mean} = \frac{7.5 \times 30 + 22.5 \times 75 + 37.5 \times 60 + 52.5 \times 15}{180} = \frac{225 + 1687.5 + 2250 + 787.5}{180} = \frac{4950}{180} = 27.5$

Above 35 min:  $10 \times 4=40$  (in 30-45) +  $15 \times 1=15$  (in 45-60)= $55 \div 180=30.6\%$

$\therefore$  (a) **30,75,60,15** (b) **27.5 min** (c)  **$\approx$ 30.6%**

### [Problem Solving] Question 5

In a standard bar chart, the height represents frequency. With unequal widths, a taller bar with a wider class would visually overrepresent that class.

Frequency density ( $\text{FD}=\text{freq} \div \text{width}$ ) ensures the AREA of each bar represents the frequency, giving a fair visual comparison regardless of class width.

$\therefore$  **Area = frequency; height alone is misleading with unequal widths.**

