Foundation / Higher

Maths GCSE Problem Solving Questions Workbook

Histograms

GRADES 6 – 9

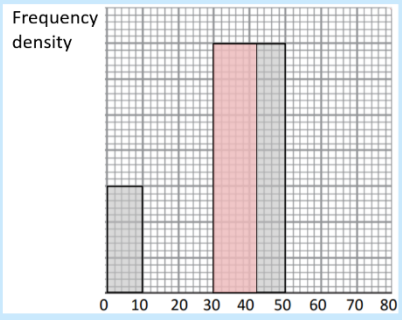
MATHS-SCHOOL

Histograms

EXAMPLE

The histogram shows information about the heights, h cm, of some plants.

Calculate an estimate for the number of plants with heights in the interval $30 < h \leq 42$



$\frac{50}{25} = 2$ **(each small square)**

Full big squares $= 7 \times 25 = 175$

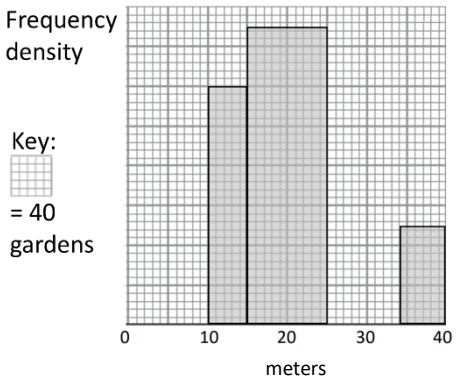
Strip of squares $= 7 \times 5 = 35$

Total small squares $= 35 + 175 = 210$

Number of plants $= 210 \times 2 = 420$

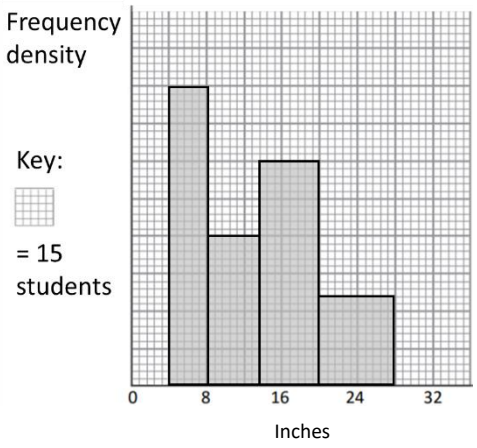
1 The histogram shows information about the lengths, m meters, of some gardens on a housing estate.

Calculate an estimate for the number of gardens with lengths in the interval $15 < m \leq 22$ meters



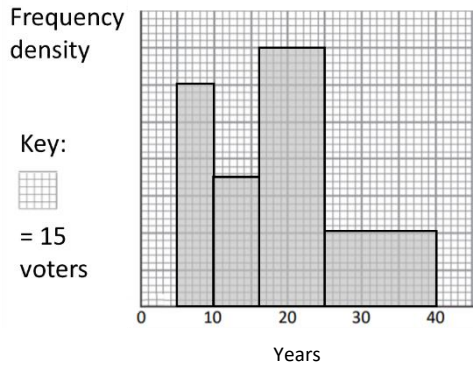
2 The histogram shows information about the feet sizes, l inches, of some student's feet.

Calculate an estimate for the number of students with feet in the interval $8 < l \leq 20$ inches



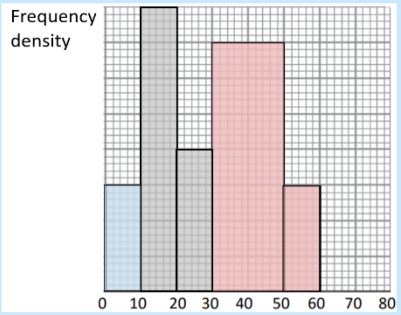
3 The histogram shows information about the age, y years, of some voters.

Estimate how many more $18 < y \leq 21$-year olds there are compared to $30 < y \leq 40$-year olds



Histograms

EXAMPLE
The histogram shows information about the ages of people attending a museum. 60 people were 10 or under. Work out an estimate for the number of the people over 30 that visited the museum

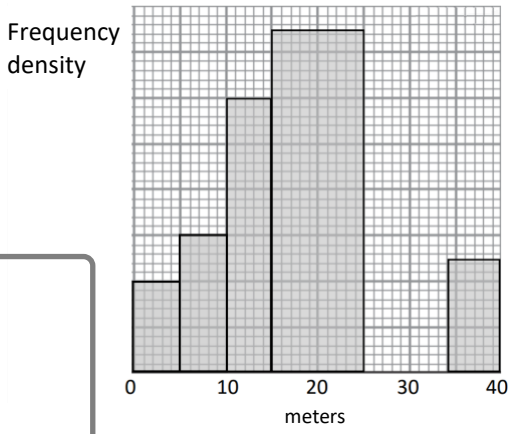


$60 \div 3 = 20$ **per big square**

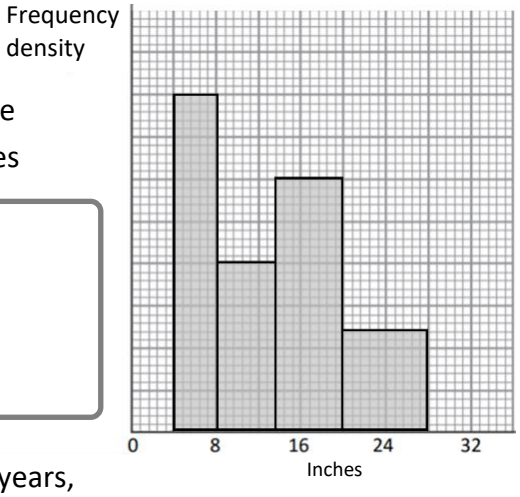
Full big squares $= 17 \times 20 = 340$

Number over 30 $= 340$

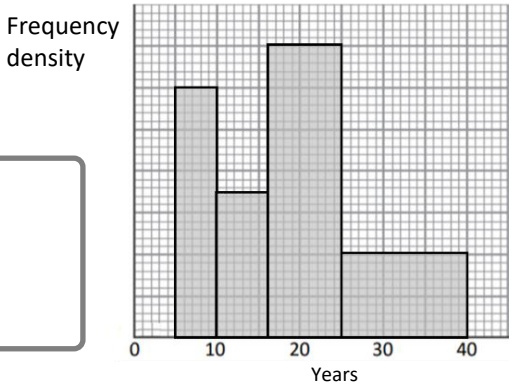
1 The histogram shows information about the lengths, m meters, of some gardens on a housing estate.
30 gardens are under 5m.
Calculate an estimate for the number of gardens with lengths in the interval $15 < m \leq 22$



2 The histogram shows information about the feet sizes, l inches, of some students' feet. 105 students have feet over 20 inches. Calculate an estimate for the number of students with feet between 8 and 16 inches



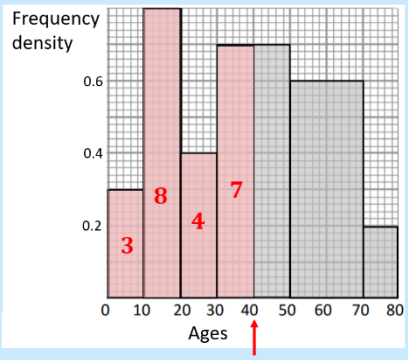
3 The histogram shows information about the age, y in years, of some voters. 180 were under 10 years old.
Estimate how many more $18 < y \leq 21$-year olds there are compared to $30 < y \leq 40$-year olds



Histograms

EXAMPLE

The histogram shows information about the ages of people attending a museum. Find an estimate for the median age of people who visited the museum



Total number of people

$10 \times 0.3 = 3$ $\quad 10 \times 0.8 = 8$

$10 \times 0.4 = 4$ $\quad 20 \times 0.7 = 14$

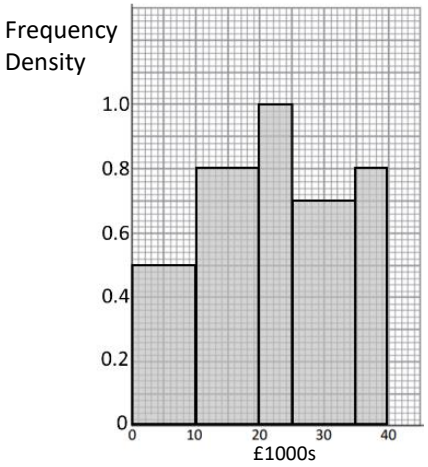
$20 \times 0.6 = 12$ $\quad 10 \times 0.2 = 2$

43 people

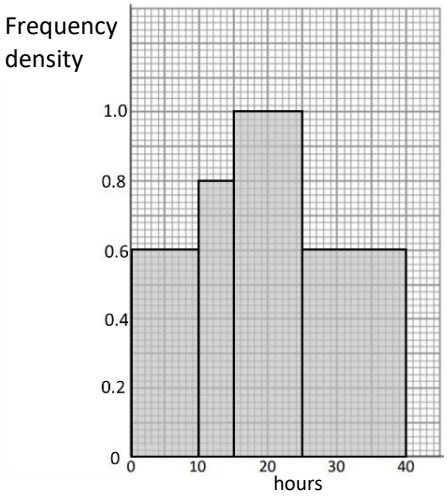
Median at $(43 + 1) \div 2 = 22$

Median at 22 $(3 + 8 + 4 + 7)$ **is** $\underline{40}$

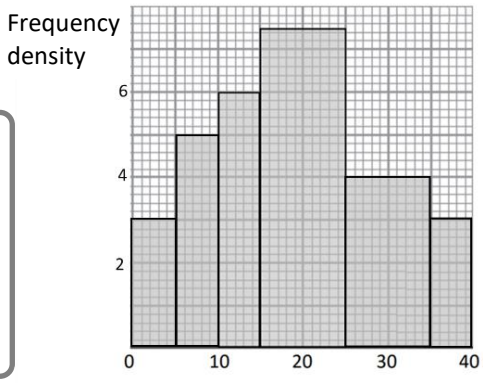
1 The histogram shows some information about the salaries of a sample of people. Calculate an estimate for the median salary of the sample.



2 The histogram shows information about hours watching tv per week for a sample of people.
Calculate an estimate for the median hours of the sample.



3 The histogram shows info about lengths, *m* meters, of some gardens on a housing estate.
Calculate an estimate to the nearest m, the median length of gardens



Solutions

Page 1 – Histograms

1. 420 :

$\frac{40}{25} = 1.6$ (each little square)

Large squares $= 7.5 \times 25 = 187.5$

Strip of squares $= 7.5 \times 10 = 75$

Total – $75 + 187.5 = 262.5$

Gardens $= 262.5 \times 1.6 = 420$

2. 228 :

$\frac{15}{25} = 0.6$ (each little square)

Large squares $= 14 \times 25 = 350$

Strip of squares $= 3 \times 10 = 30$

Total – $350 + 30 = 380$

Students $= 380 \times 0.6 = 228$

3. 3 :

$\frac{15}{25} = 0.6$ (each little square)

18-21: $= 7 \times 3 \times 5 = 105$

30-40: $= 4 \times 25 = 100$

Difference $= 105 - 100 = 5$

Number more $= 5 \times 0.6 = 3$

Page 2 – Histograms

1. 135 :

$\frac{30}{50} = 0.6$ (each little square)

Large squares $= 7.5 \times 25 = 187.5$

Strip of squares $= 7.5 \times 5 = 37.5$

Total $= 37.5 + 187.5 = 225$

Number of gardens $= 225 \times 0.6 = 135$

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Page 2 – Histograms

2. 184 :

$\frac{96}{120} = 0.8$ (each little square)

Full big squares $= 8 \times 25 = 200$

Strip of squares $= 3 \times 10 = 30$

Total – $200 + 30 = 230$

Students $= 230 \times 0.8 = 184$

3. 46 : 4 big squares $= 20$

Full big square $=$ 5 cows:

Strip of 5 small squares $= 1$ cow

Full big squares $= 8 \times 5 = 40$

Strips of 5 small squares $= 6 \times 1 = 6$

Total $= 40 + 6 = 46$

Page 3 – Histograms (Median)

1. 20 :

$10 \times 0.5 = 5$ $5 \times 0.8 = 4$

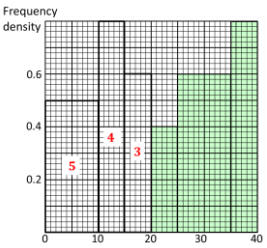
$5 \times 0.6 = 3$ $5 \times 0.4 = 2$

$10 \times 0.6 = 6$ $5 \times 0.8 = 4$

→ Total = 24 people

Median $- 24 \div 2 = 12$

Median at 12 $(5 + 4 + 3)$ is <u>20</u>



3. 19 :

$5 \times 3 = 15$ $5 \times 5 = 25$

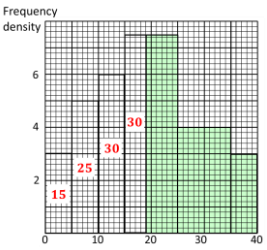
$5 \times 6 = 30$ $10 \times 7.5 = 75$

$10 \times 4 = 40$

→ Total = 200 people

Median $- 200 \div 2 = 100$

Median at 100 $(15 + 25 + 30 + 30)$ is <u>19</u>



3. £18,750 :

$10 \times 0.5 = 5$ $10 \times 0.8 = 8$

$5 \times 0.6 = 3$ $10 \times 0.4 = 4$

$5 \times 0.8 = 4$

→ Total = 24 people

Median $- 24 \div 2 = 12$

$10 \div 8 \times 7 = 8.75$

Median at 12 $(5 + 7)$ is <u>18.75</u>