# Histograms

GCSE Mathematics • **Higher Tier** • Grades 7–8 • Non-calculator

Name: _____ Class: _____ Total: _____ / 51

*Show all your working. Marks are given for correct method as well as the final answer.*

**1.** Write down the formula for frequency density. **[1 mark]**

**Answer:** _____

**2.** Complete the class width row of the table. **[2 marks]**

| **Time $t$ (min)** | $0 < t \leq 10$ | $10 < t \leq 20$ | $20 < t \leq 40$ | $40 < t \leq 70$ |
|---|---|---|---|---|
| **Frequency** | 12 | 28 | 30 | 18 |
| **Class width** | | | | |
| **Frequency density** | | | | |

**Answer:** _____

**3.** Work out the frequency density for $0 < t \leq 10$. **[2 marks]**

| **Time $t$ (min)** | $0 < t \leq 10$ | $10 < t \leq 20$ | $20 < t \leq 40$ | $40 < t \leq 70$ |
|---|---|---|---|---|
| **Frequency** | 12 | 28 | 30 | 18 |
| **Class width** | | | | |
| **Frequency density** | | | | |

**Answer:** _____

**4.** Work out the frequency density for $10 < t \leq 20$. **[2 marks]**

| **Time $t$ (min)** | $0 < t \leq 10$ | $10 < t \leq 20$ | $20 < t \leq 40$ | $40 < t \leq 70$ |
|---|---|---|---|---|
| **Frequency** | 12 | 28 | 30 | 18 |
| **Class width** | | | | |
| **Frequency density** | | | | |

**Answer:** _____

**5.** Work out the frequency density for $20 < t \leq 40$. **[2 marks]**

| **Time $t$ (min)** | $0 < t \leq 10$ | $10 < t \leq 20$ | $20 < t \leq 40$ | $40 < t \leq 70$ |
|---|---|---|---|---|
| **Frequency** | 12 | 28 | 30 | 18 |
| **Class width** | | | | |
| **Frequency density** | | | | |

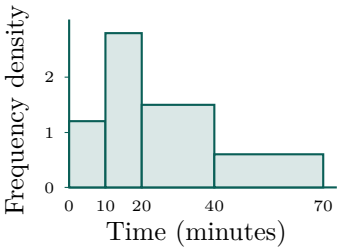
**Answer:** _____

**6.** Work out the frequency density for $40 < t \leq 70$. **[2 marks]**

| **Time $t$ (min)** | $0 < t \leq 10$ | $10 < t \leq 20$ | $20 < t \leq 40$ | $40 < t \leq 70$ |
|---|---|---|---|---|
| **Frequency** | 12 | 28 | 30 | 18 |
| **Class width** | | | | |
| **Frequency density** | | | | |

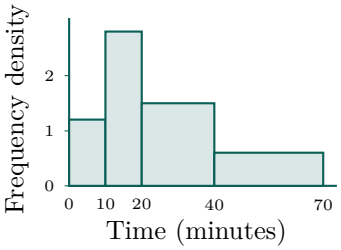
**Answer:** _____

**7.** Explain why the $20 < t \leq 40$ bar is shorter than the $10 < t \leq 20$ bar even though it holds more data. **[3 marks]**



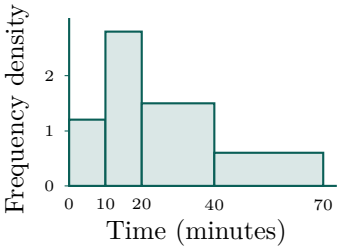

**Answer:** _____

**8.** Use the histogram to work out the frequency for $0 < t \leq 10$. **[2 marks]**



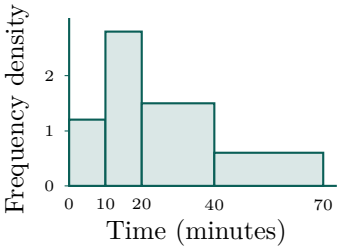

**Answer:** _____

**9.** Use the histogram to work out the frequency for $40 < t \leq 70$. **[2 marks]**



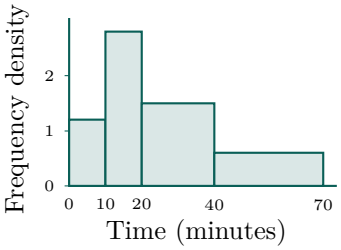

**Answer:** _____

**10.** Use the histogram to work out the total frequency. **[3 marks]**



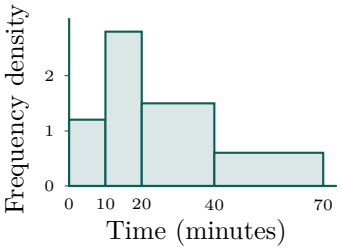

**Answer:** _____

**11.** Use the histogram to estimate how many took between 20 and 30 minutes. **[3 marks]**



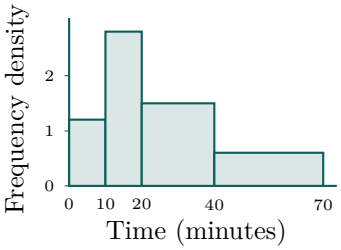

**Answer:** _____

**12.** Use the histogram to estimate how many took between 15 and 25 minutes. **[4 marks]**



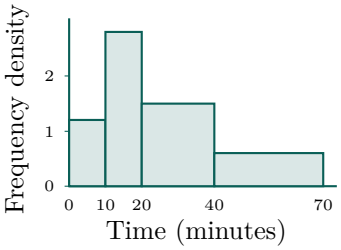

**Answer:** _____

**13.** Use the histogram to estimate how many took more than 50 minutes. **[3 marks]**




**Answer:** _____

**14.** Use the histogram to estimate the fraction who took 10 minutes or less. **[3 marks]**




**Answer:** _____

**15.** Explain the difference between a histogram and a bar chart. **[2 marks]**

**Answer:** _____

**16.** A histogram bar is 4 $cm^2$ in area and represents 20 people. Work out how many people 1 $cm^2$ represents. **[2 marks]**

**Answer:** _____

**17.** On that histogram, another bar has area 7 $cm^2$. Work out its frequency. **[2 marks]**

**Answer:** _____

**18.** Explain why you can only ESTIMATE the number in part of a class from a histogram. **[2 marks]**

**Answer:** _____

**19.** A histogram has classes $0 < x \leq 5$ with frequency 20, and $5 < x \leq 25$ with frequency 30.

**(a)** Work out the two frequency densities. **[3 marks]**

**(b)** Write down which bar is taller and why. **[2 marks]**

**Answer:** _____

**20.** The table shows the ages at a club. $30 < a \leq 50$ has frequency 24, and the bar for $50 < a \leq 60$ has frequency density 0.9.

**(a)** Work out the frequency density for $30 < a \leq 50$. **[2 marks]**

**(b)** Work out the frequency for $50 < a \leq 60$. **[2 marks]**

**Answer:** _____

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