

GCSE Maths: Histograms (Higher): answers

GCSE Maths - Statistics - Higher - Lesson 24.15

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch24-statistics/higher/histograms/

Exercise 240 Histograms Calculator allowed

- 1 The table shows the ages of the members of a club.

Age	Frequency
$0 < a \leq 20$ years	20
$20 < a \leq 30$ years	35
$30 < a \leq 40$ years	50
$40 < a \leq 60$ years	40
$60 < a \leq 100$ years	16

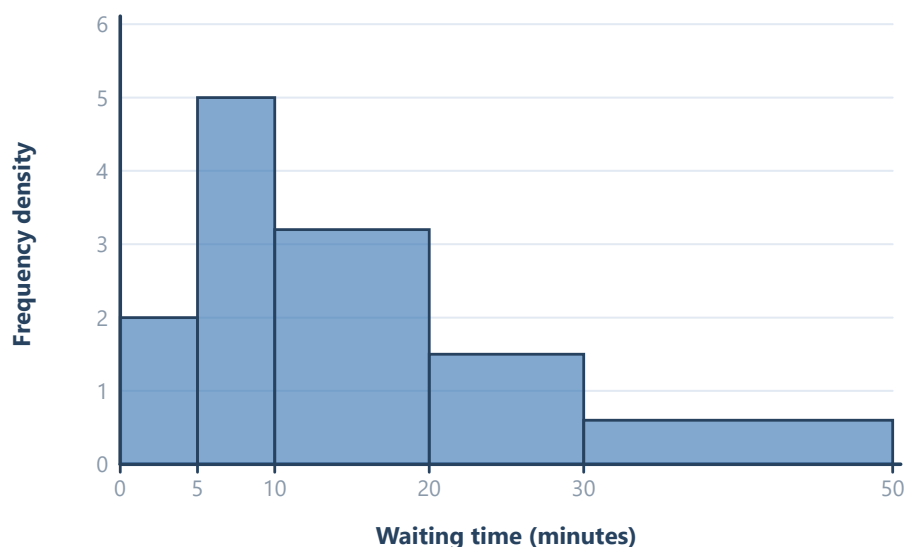
Work out the frequency density for each class.

Answer: 1, 3.5, 5, 2, 0.4

- 2 Use the table in question 1 to draw a histogram.

Answer: See the histogram in the solution

- 3 The histogram shows the waiting times at a clinic. (a) Work out the number of patients who waited between 10 and 20 minutes. (b) Work out the number of patients who waited between 0 and 5 minutes. (c) Work out the total number of patients.



- (a) Waited 10 to 20 minutes

Answer: 32

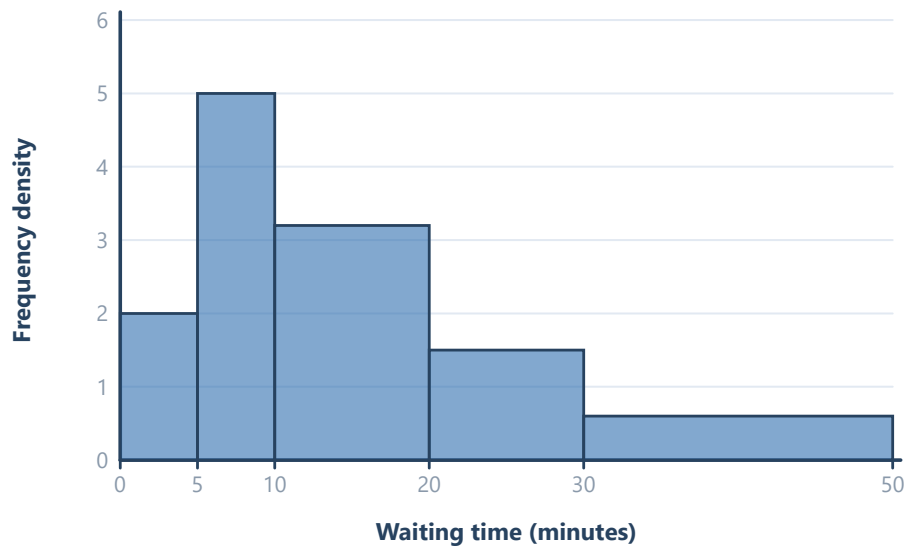
- (b) Waited 0 to 5 minutes

Answer: 10

(c) Total patients

Answer: 94

- 4 Use the histogram in question 3 to estimate the number of patients who waited (a) between 24 and 30 minutes, (b) more than 40 minutes, (c) between 15 and 20 minutes.



(a) Between 24 and 30 minutes

Answer: 9

(b) More than 40 minutes

Answer: 6

(c) Between 15 and 20 minutes

Answer: 16

- 5 The table shows the lengths of 120 phone calls.

Length	Frequency
$0 < t \leq 10$ min	12
$10 < t \leq 20$ min	28
$20 < t \leq 40$ min	50
$40 < t \leq 60$ min	30

Estimate the mean length of a call. Give your answer to 1 decimal place.

Answer: 29.0 min

- 6 Estimate the median length of a call using the table in question 5.

Answer: 28 min

- 7 In a histogram, the bar for $20 < x \leq 30$ is 3 cm wide and 4 cm tall, and represents 24 people. The bar for $30 < x \leq 50$ is 6 cm wide and 2 cm tall. How many people does the second bar represent?

Answer: 24

- 8 The bar for $0 < t \leq 10$ in a histogram has frequency density 4 and frequency 40. The next bar is for $10 < t \leq 30$ and has frequency 100. Work out the frequency density of the second bar and say how its height compares with the first bar.

Answer: 5; it is taller than the first bar

- 9 Jon says: "The tallest bar in a histogram is always the class with the most values." Explain why he is wrong, using an example.

Answer: The height is the frequency density, so a wide class with a lower bar can still have more values.

- 10 The histogram bars for four classes have the widths and frequencies shown. Complete the table of frequency densities and work out the probability that a person chosen at random from the data is in the class 25 to 30. Give your answer as a fraction in its simplest form.

Class	Frequency
$0 < x \leq 10$	15
$10 < x \leq 25$	45
$25 < x \leq 30$	10
$30 < x \leq 50$	50

- (a) Frequency densities

Answer: 1.5, 3, 2, 2.5

- (b) Probability

Answer: $\frac{1}{12}$

- 11 A histogram shows the masses of 150 parcels. The class $2 < m \leq 4$ has frequency density 15, the class $4 < m \leq 10$ has frequency density 8 and the class $10 < m \leq 20$ has frequency density 4.6. Work out the number of parcels in the class $0 < m \leq 2$, and the mean mass to 1 decimal place if that class has midpoint 1.

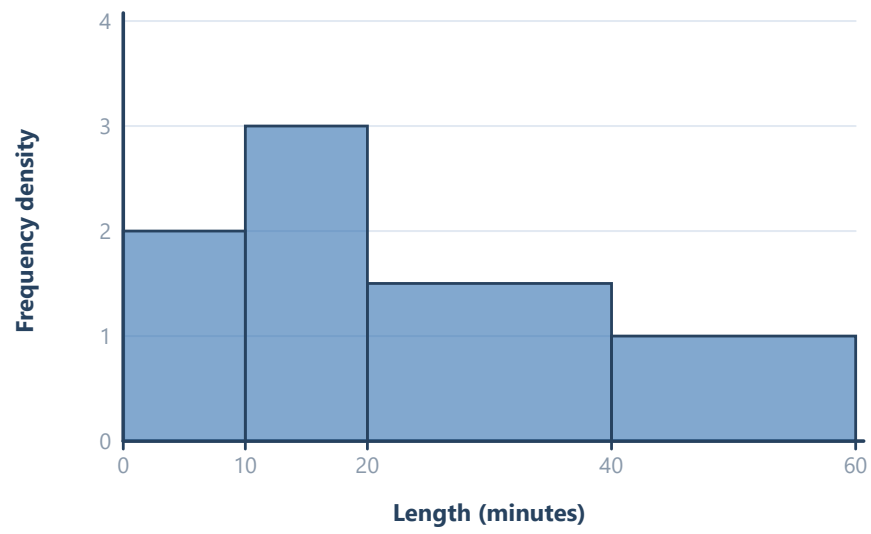
- (a) Parcels in the class 0 to 2

Answer: 26

- (b) Estimated mean

Answer: 7.6

- 12 The histogram shows the lengths of 100 films, in minutes. Estimate the percentage of films that are longer than 30 minutes.



Answer: 35%