

Walking Talking - Histograms

1.

- (a) As part of a quality control exercise in a supermarket, the time taken to scan 20 items was measured for each worker under the age of 40. A printout of the histogram that illustrates the results obtained is shown below.



Unfortunately, the labelling of the frequency density axis was missing from the printout. It is known that there were 12 workers under the age of 40 that took more than 16 seconds to scan the 20 items.

- (i) Complete the labelling of the scale on the frequency density axis.

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[3]

- (ii) Calculate how many workers under the age of 40 took part in this quality control exercise.

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[2]

- (iii) Calculate an estimate of the median time taken by a worker under the age 40 to scan 20 items.

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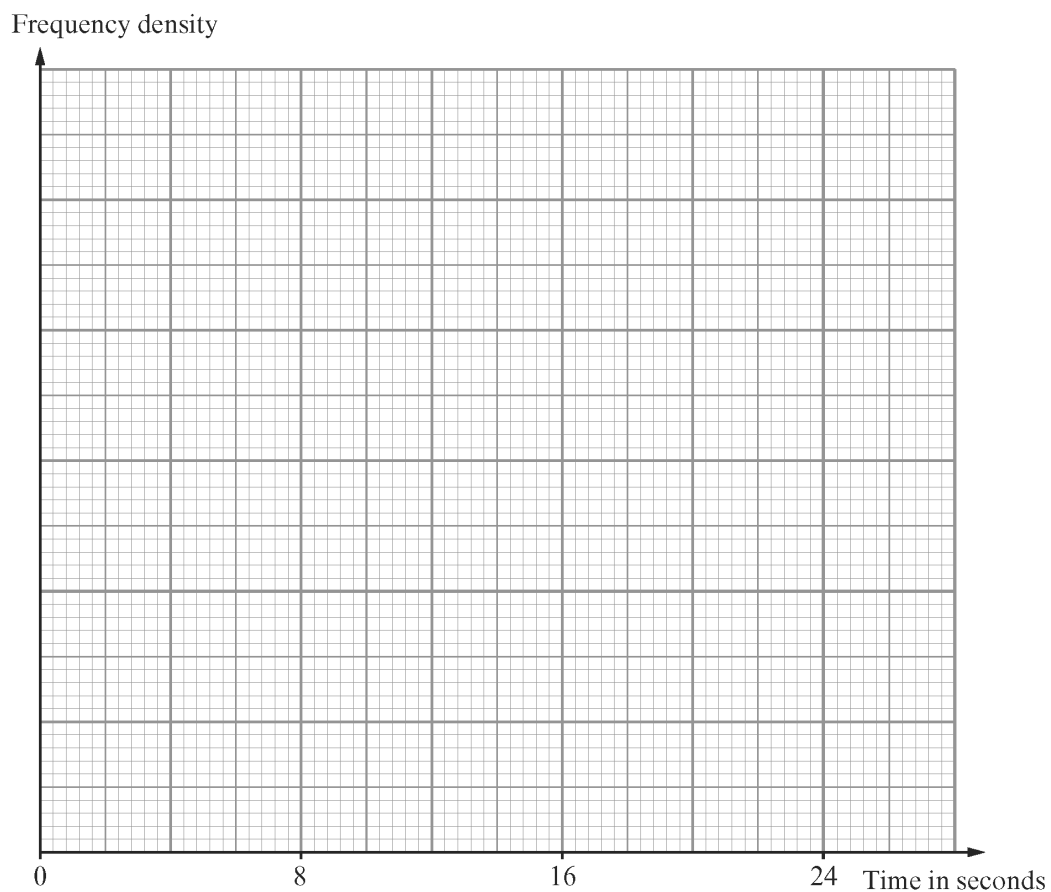
[4]

- (b) As part of the quality control exercise in a supermarket, the time taken to scan 20 items was measured for each worker aged 40 or over. The table below shows the results.

Time in seconds, t	$0 < t \leq 4$	$4 < t \leq 8$	$8 < t \leq 12$	$12 < t \leq 16$	$16 < t \leq 24$
Number of workers	0	2	36	24	8

Complete the scale on the frequency density axis and draw a histogram to illustrate the distribution on the graph paper below.

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[3]

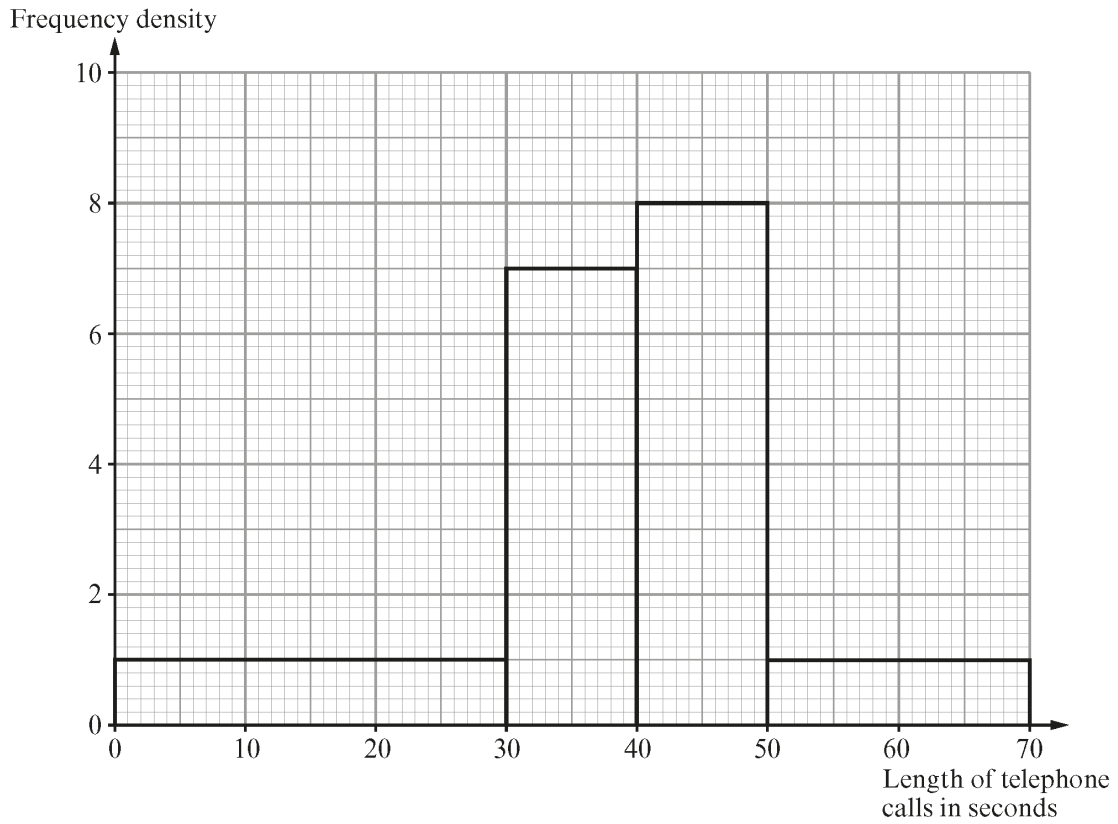
- (c) Which of the two groups of workers is, on average, quicker at scanning 20 items in the supermarket? You must give a reason for your answer.

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[1]

2.

The histogram illustrates the lengths of telephone calls made to a computer helpline during one Tuesday evening.



(a) Calculate how many telephone calls were made to the computer helpline during the Tuesday evening.

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[3]

(b) Estimate the median length of a telephone call made to the computer helpline during the Tuesday evening.

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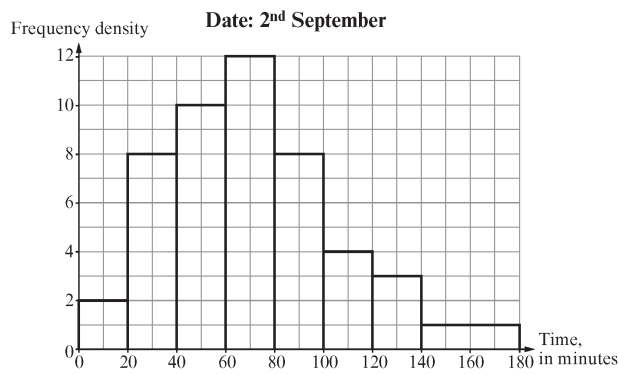
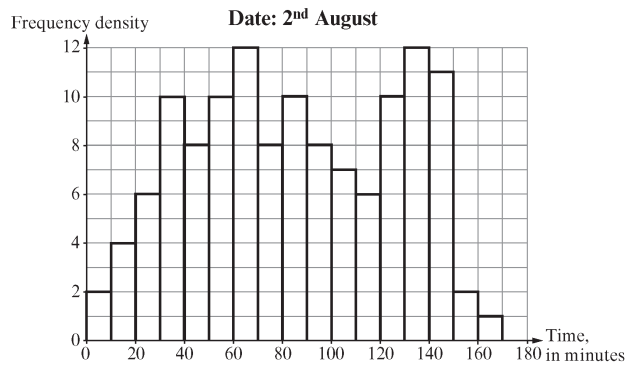
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[2]

The histograms below show the total times that office workers in a company spent on the phone on 2nd August and on 2nd September.



- (a) Calculate the number of office workers who spent a total time of 60 minutes or less on the phone on 2nd August. [3]

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(b) Explain why it is not possible to use the histogram to calculate how many telephone calls were made on 2nd August?

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[1]

(c) Grant suggested that it is not possible to calculate exactly how many office workers spent longer than 130 minutes on the telephone on 2nd September. Is Grant correct? You must give a reason for your answer.

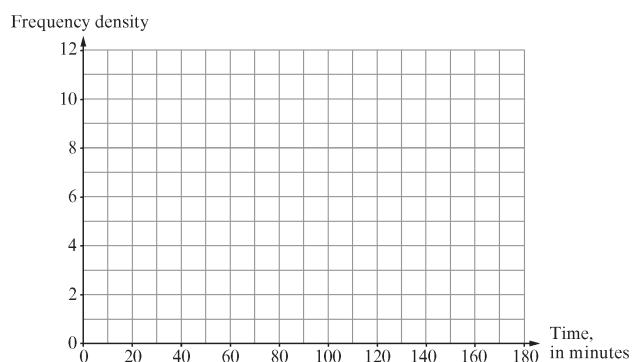
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[1]

(d) Use the graph paper below to redraw the 2nd August histogram, using groups of the same width as those in the histogram for 2nd September.

[3]

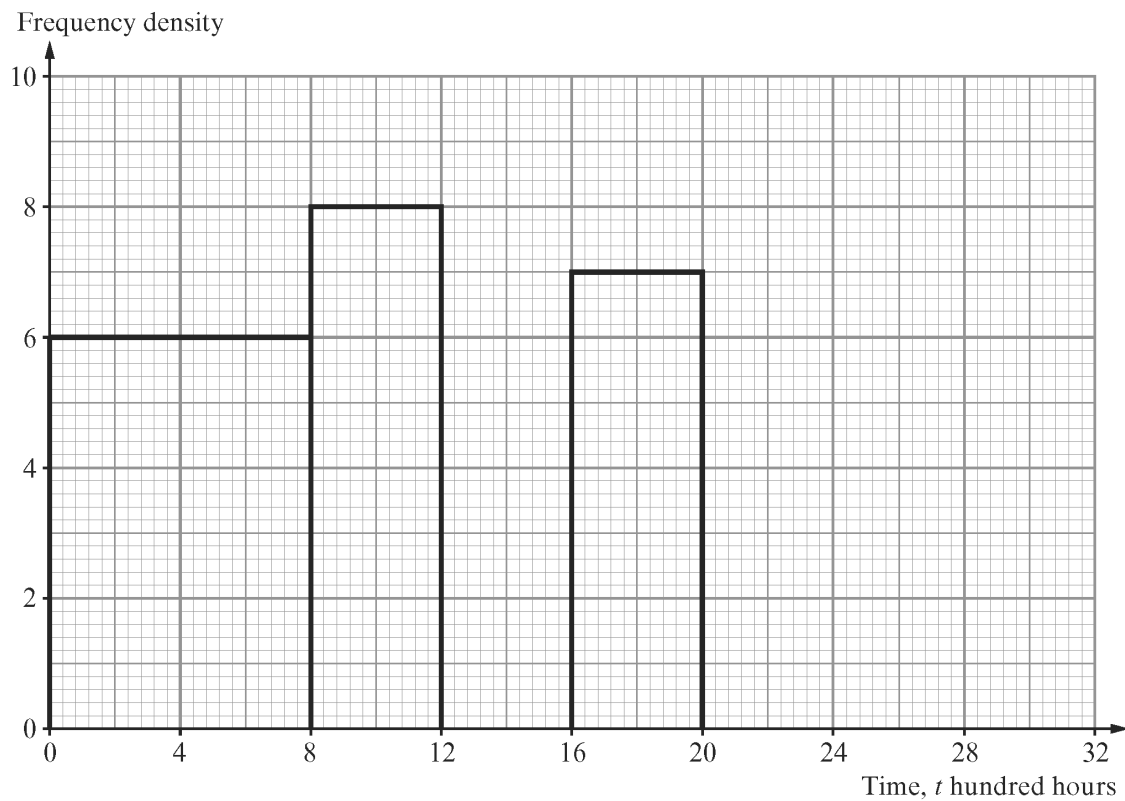
Date: 2nd August



5.

The histogram and frequency table show some information about the time, in hundreds of hours, that a number of similar light bulbs lasted.

Time, t hundred hours	Number of light bulbs
$0 < t \leq 8$	48
$8 < t \leq 12$
$12 < t \leq 16$	40
$16 < t \leq 20$
$20 < t \leq 30$	20



(a) Complete the frequency table and the histogram shown opposite.

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[4]

(b) Find the estimate for the number of light bulbs that lasted between 2000 hours and 2400 hours.

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(c) There are 56 bulbs that lasted less than y hundred hours.
Calculate an estimate for y .

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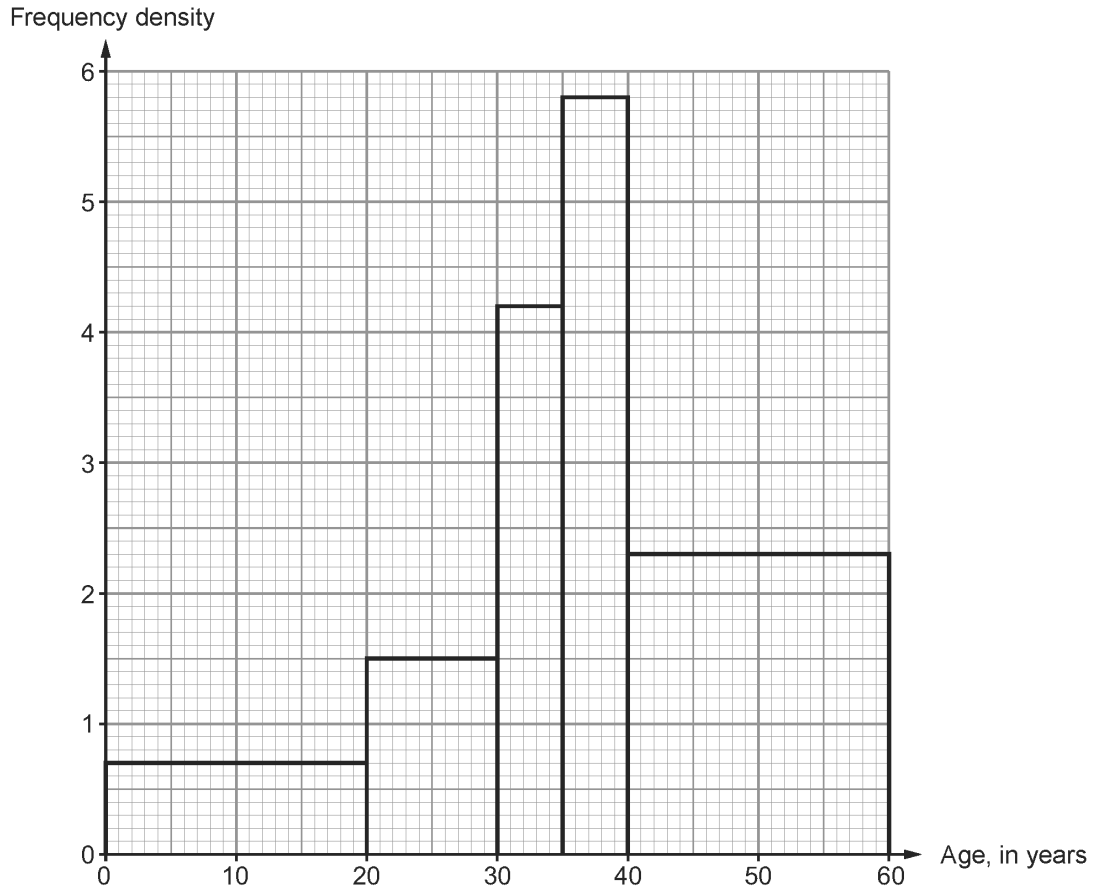
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[3]

6.

The histogram below shows the ages of the people staying in a hotel one weekend.



(a) Use the histogram to complete the grouped frequency table below. [2]

Age in years	$0 \leq a < 20$	$20 \leq a < 30$	$30 \leq a < 35$	$35 \leq a < 40$	$40 \leq a < 60$
Frequency					

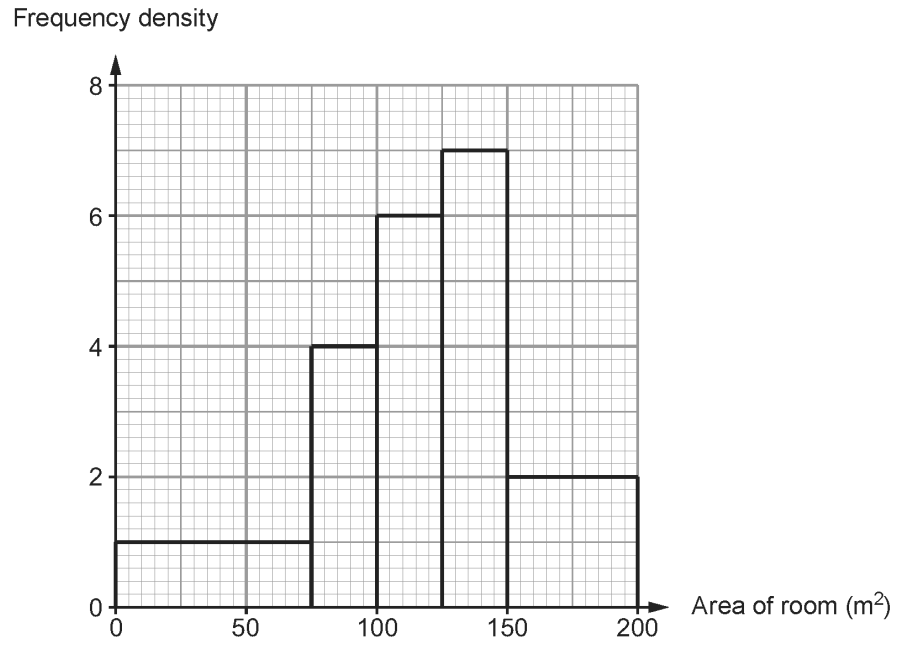
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(b) Calculate an estimate of the number of people whose ages are less than 24 years old. [2]

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7.

The histogram illustrates the floor areas of the offices available to let by *Office Space UK* letting agency.



(a) Calculate how many of the offices available to let have a floor area greater than 75 m². [3]

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- (b) *Office Space UK* charges a £200 arrangement fee when any of the offices with a floor area of up to 100m² are let.
Assuming that all of the offices less than 100m² are let, how much will *Office Space UK* receive in arrangement fees for these offices?
Give your answer in standard form. [4]

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- (c) It is reported that the median size of office space available to let is 80m².
Is this true for the offices that are available to let by *Office Space UK*?
You must give a reason for your answer. [2]

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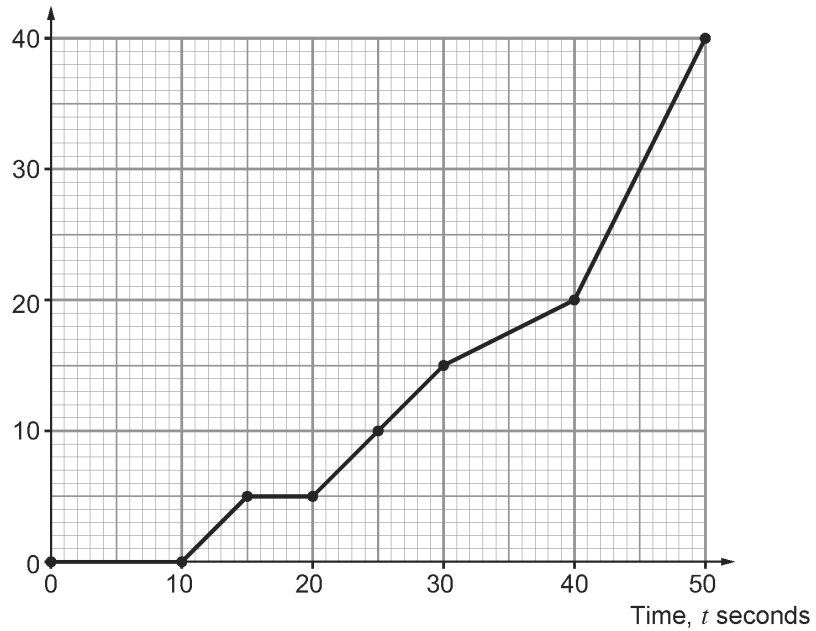
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8.

The cumulative frequency diagram shows the time taken by 40 athletes to complete a trial.

Cumulative frequency



- (a) Athletes completing the trial within 20 seconds are considered to be 'outstanding'. How many athletes are 'outstanding'? [1]

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- (b) Athletes completing the trial between 20 seconds and 40 seconds are considered to be 'excellent'. How many athletes are 'excellent'? [1]

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- (c) Write down an estimate for the interquartile range of the times. You must show your working. [2]

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- (d) Using the same class intervals as used in the cumulative frequency diagram, draw a histogram to illustrate the time taken by the 40 athletes to complete the trial. [5]

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