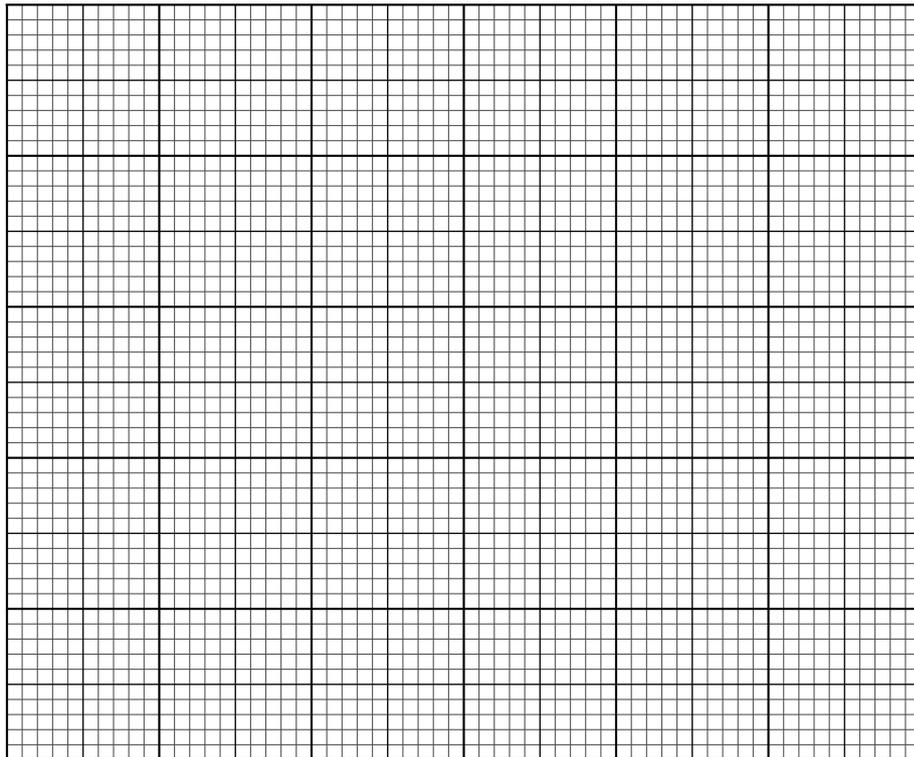**3** At a summer camp an arithmetic test is taken by 250 children. The times taken, to the nearest minute, to complete the test were recorded. The results are summarised in the table.

Time taken, in minutes	1 – 30	31 – 45	46 – 65	66 – 75	76 – 100
Frequency	21	30	68	86	45

   (a) Draw a histogram to represent this information. [4]

   (b) State which class interval contains the median. [1]

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   (c) Given that an estimate of the mean time is 61.05 minutes, state what feature of the distribution accounts for the median and the mean being different. [1]

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3 The times taken, in minutes, by 360 employees at a large company to travel from home to work are summarised in the following table.

Time, t minutes	$0 \leqslant t < 5$	$5 \leqslant t < 10$	$10 \leqslant t < 20$	$20 \leqslant t < 30$	$30 \leqslant t < 50$
Frequency	23	102	135	76	24

    (a) Draw a histogram to represent this information. [4]

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(b) Calculate an estimate of the mean time taken by an employee to travel to work. [2]

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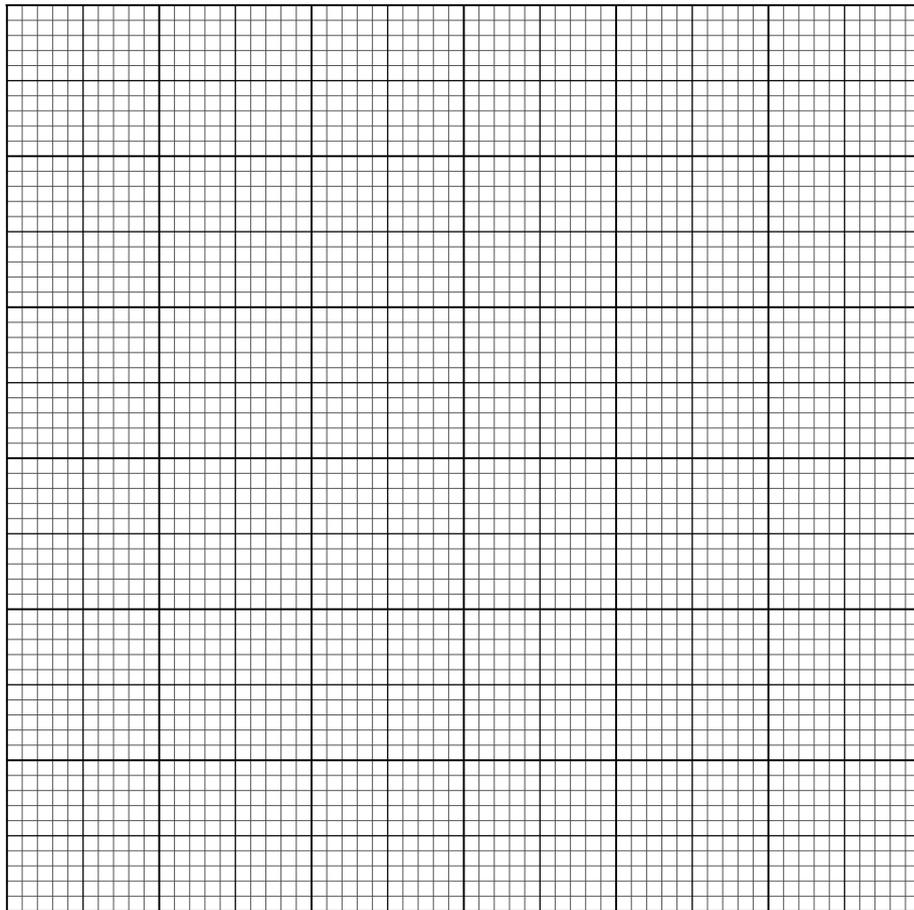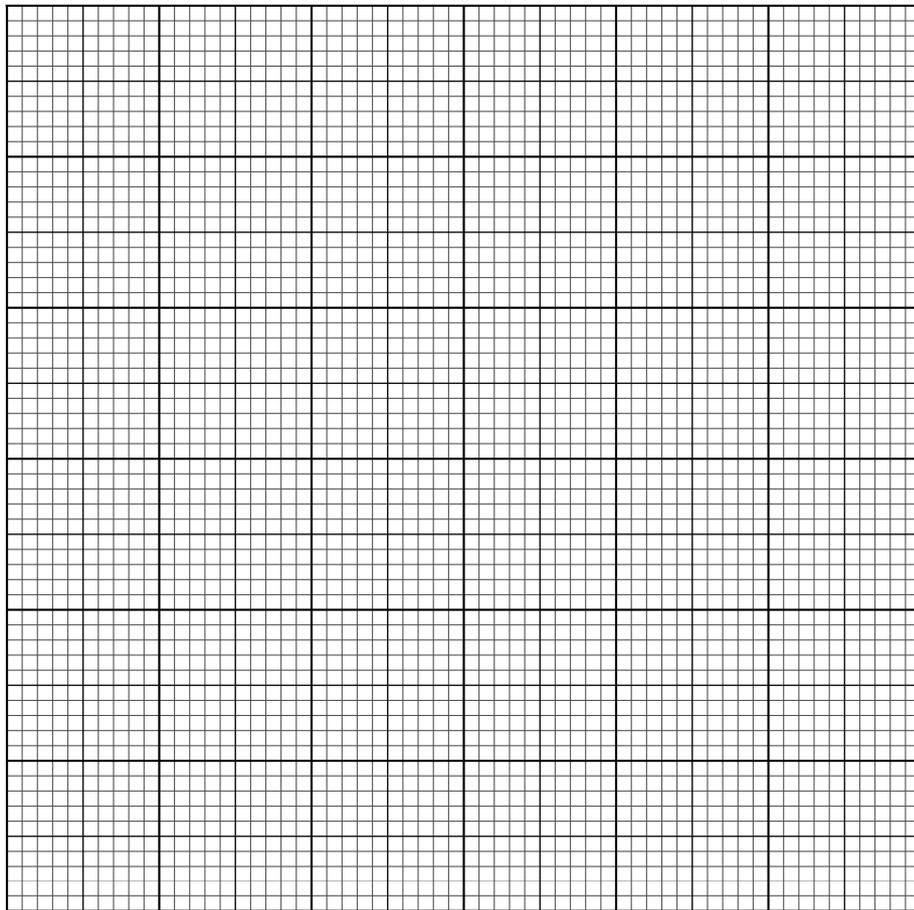
4 The times taken, in minutes, to complete a word processing task by 250 employees at a particular company are summarised in the table.

Time taken (t minutes)	$0 \leqslant t < 20$	$20 \leqslant t < 40$	$40 \leqslant t < 50$	$50 \leqslant t < 60$	$60 \leqslant t < 100$
Frequency	32	46	96	52	24

(a) Draw a histogram to represent this information. [4]

From the data, the estimate of the mean time taken by these 250 employees is 43.2 minutes.

(b) Calculate an estimate for the standard deviation of these times. [3]

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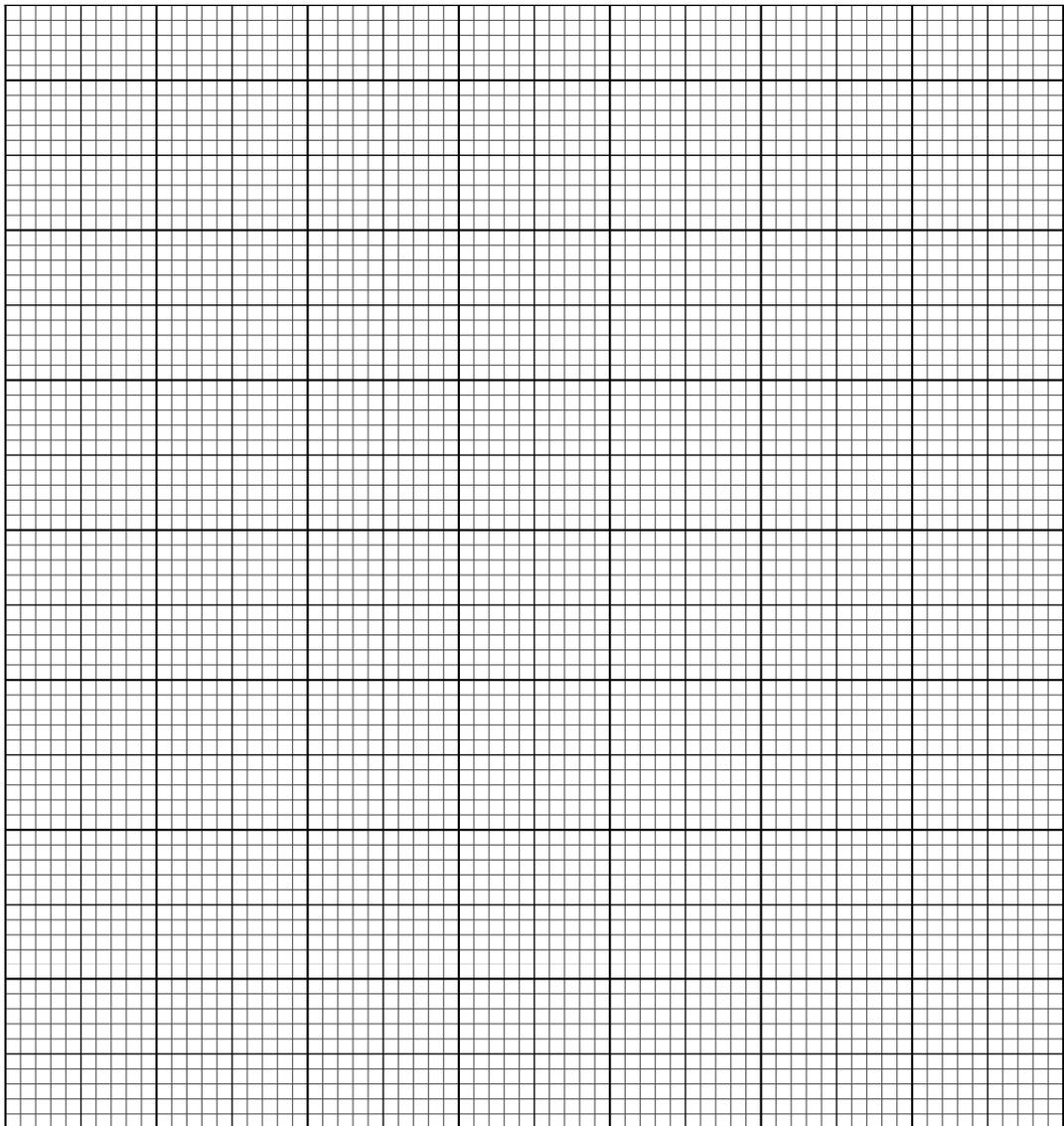
4 The times, to the nearest minute, of 150 athletes taking part in a charity run are recorded. The results are summarised in the table.

Time in minutes	101 – 120	121 – 130	131 – 135	136 – 145	146 – 160
Frequency	18	48	34	32	18

(a) Draw a histogram to represent this information. [4]

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(b) Calculate estimates for the mean and standard deviation of the times taken by the athletes. [5]
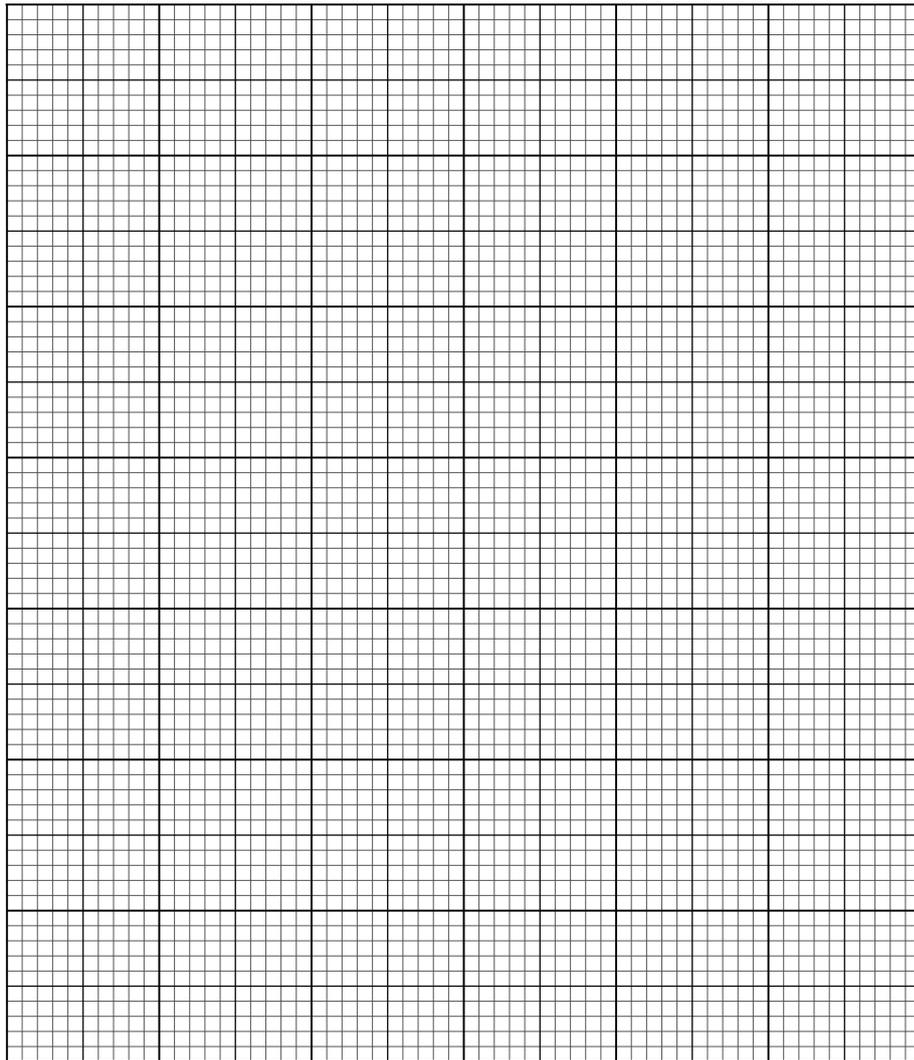
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5 The times taken by 200 players to solve a computer puzzle are summarised in the following table.

Time (t seconds)	$0 \leqslant t < 10$	$10 \leqslant t < 20$	$20 \leqslant t < 40$	$40 \leqslant t < 60$	$60 \leqslant t < 100$
Number of players	16	54	78	32	20

(a) Draw a histogram to represent this information. [4]

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(b) Calculate an estimate of the mean time taken by these 200 players. [2]

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(c) Find the greatest possible value of the interquartile range of these times. [2]

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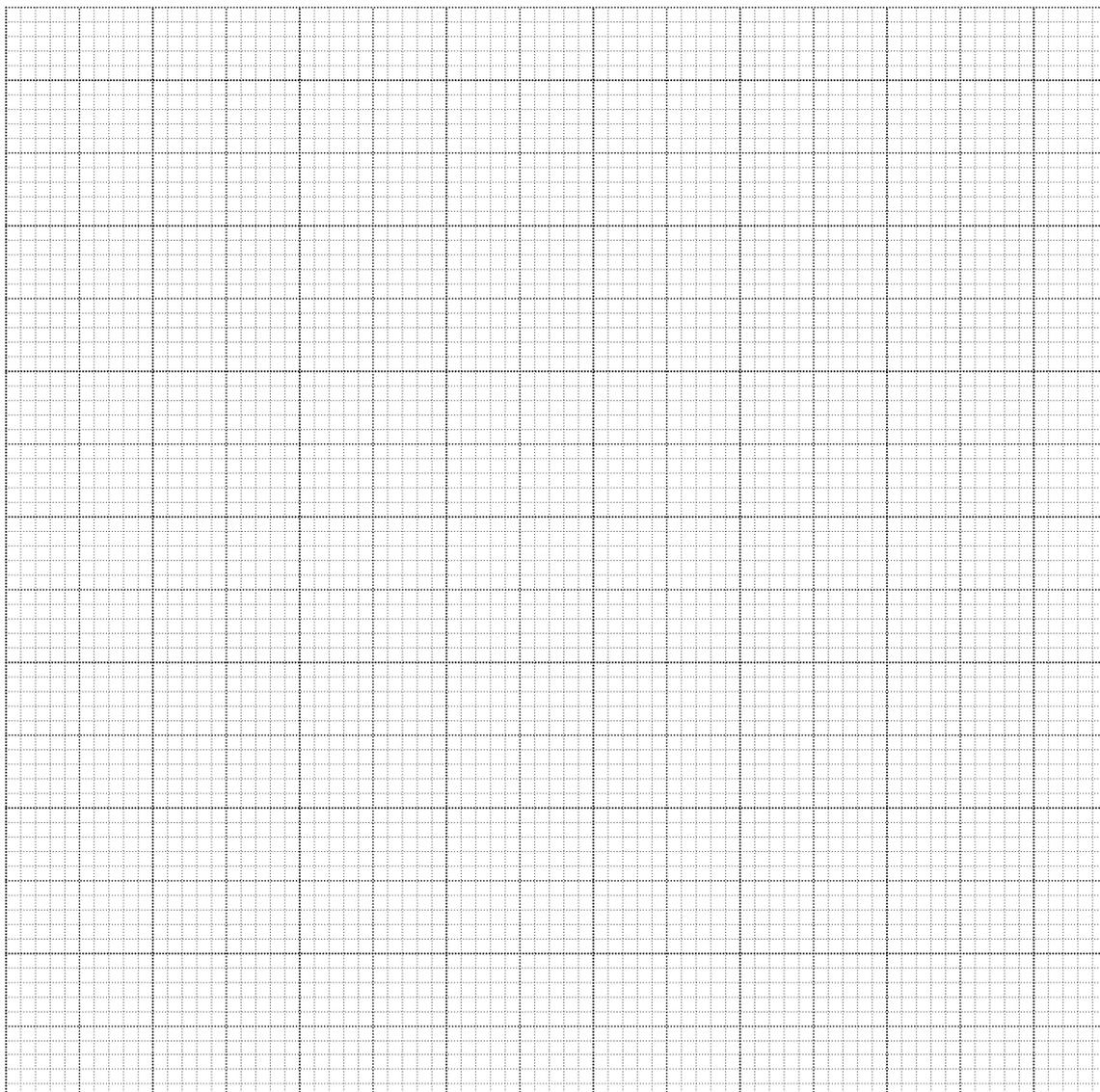
7 A particular piece of music was played by 91 pianists and for each pianist, the number of incorrect notes was recorded. The results are summarised in the table.

Number of incorrect notes	1 – 5	6 – 10	11 – 20	21 – 40	41 – 70
Frequency	10	5	26	32	18

(a) Draw a histogram to represent this information.   [5]

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(b) State which class interval contains the lower quartile and which class interval contains the upper quartile.

Hence find the greatest possible value of the interquartile range. [2]

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(c) Calculate an estimate for the mean number of incorrect notes. [3]

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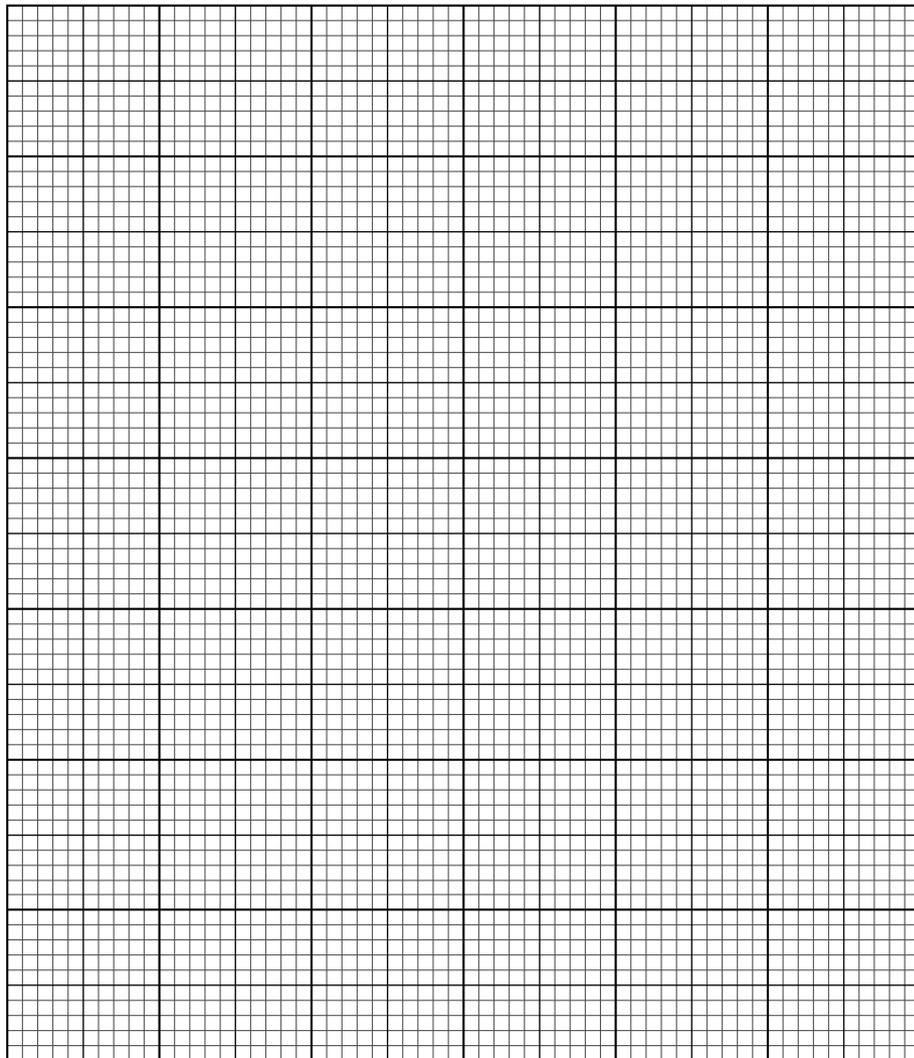
5 The populations of 150 villages in the UK, to the nearest hundred, are summarised in the table.

Population	100 – 800	900 – 1200	1300 – 2000	2100 – 3200	3300 – 4800
Number of villages	8	12	50	48	32

(a) Draw a histogram to represent this information. [4]

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(b) Write down the class interval which contains the median for this information. [1]

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(c) Find the greatest possible value of the interquartile range for the populations of the 150 villages. [2]

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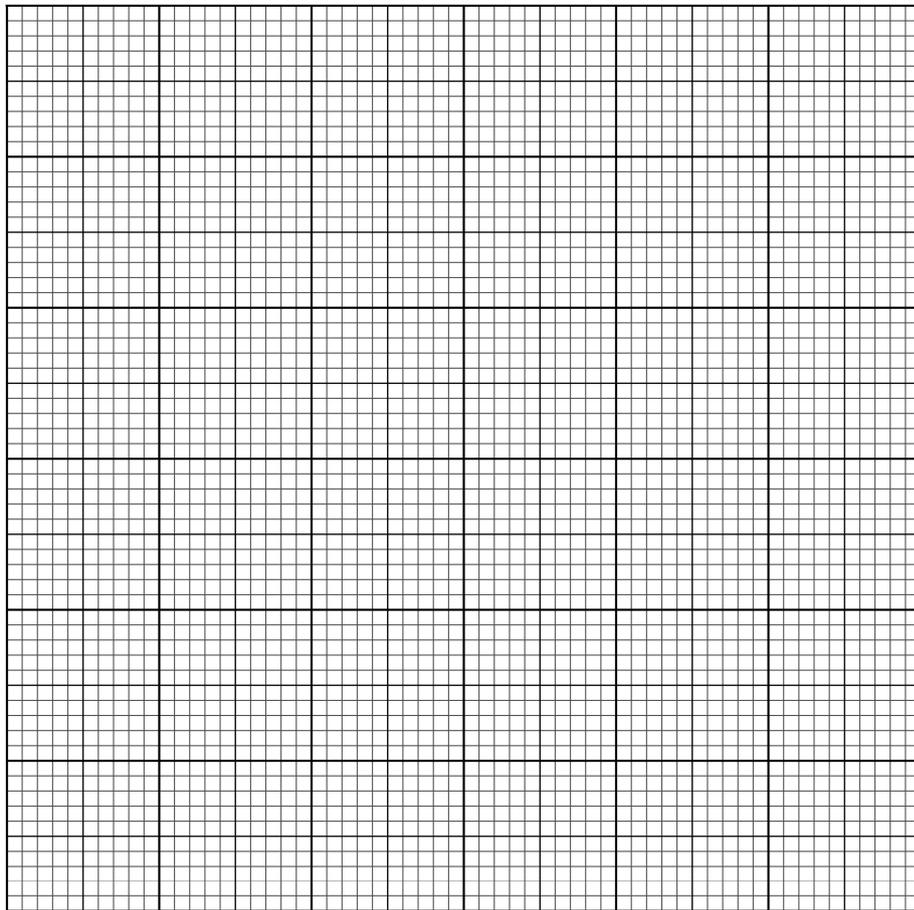
3 The times taken to travel to college by 2500 students are summarised in the table.

Time taken (t minutes)	$0 \leqslant t < 20$	$20 \leqslant t < 30$	$30 \leqslant t < 40$	$40 \leqslant t < 60$	$60 \leqslant t < 90$
Frequency	440	720	920	300	120

(a) Draw a histogram to represent this information. [4]

From the data, the estimate of the mean value of t is 31.44.

(b) Calculate an estimate of the standard deviation of the times taken to travel to college. [3]

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(c) In which class interval does the upper quartile lie? [1]

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It was later discovered that the times taken to travel to college by two students were incorrectly recorded. One student's time was recorded as 15 instead of 5 and the other's time was recorded as 65 instead of 75.

(d) Without doing any further calculations, state with a reason whether the estimate of the standard deviation in part **(b)** would be increased, decreased or stay the same. [1]
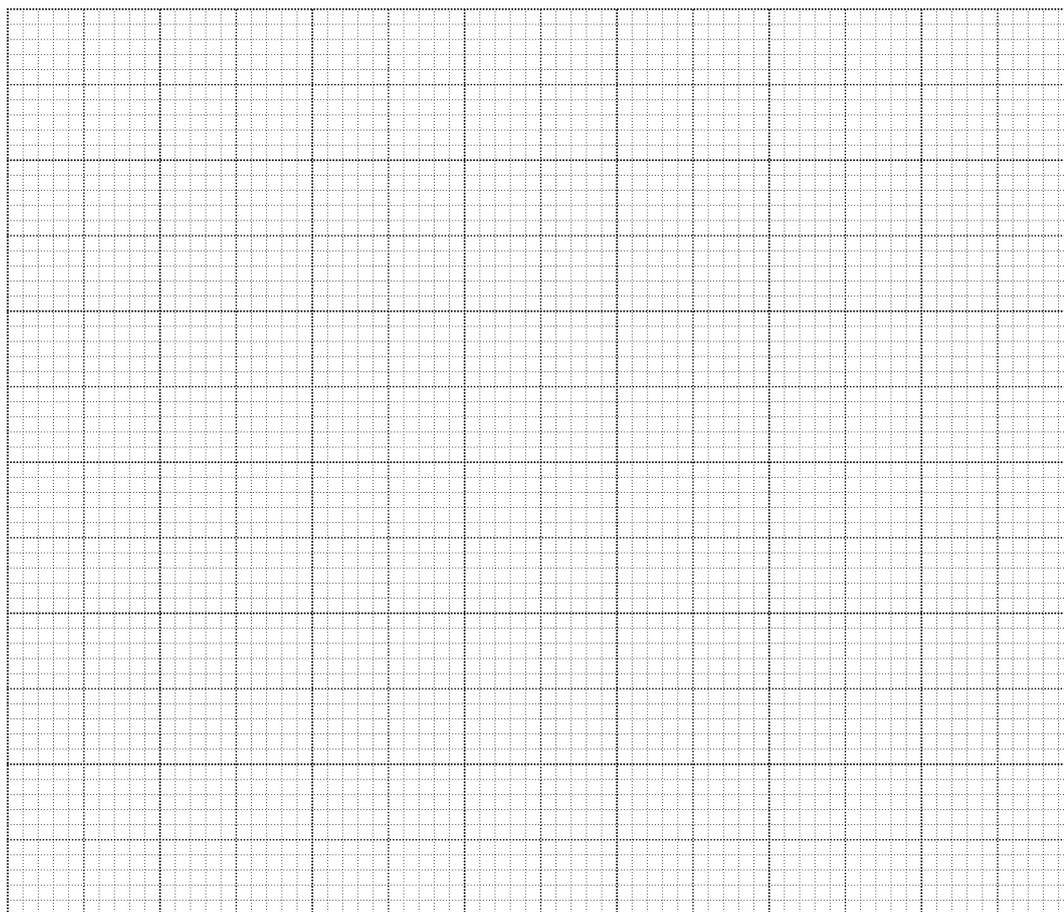
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7 The numbers of chocolate bars sold per day in a cinema over a period of 100 days are summarised in the following table.

Number of chocolate bars sold	1 – 10	11 – 15	16 – 30	31 – 50	51 – 60
Number of days	18	24	30	20	8

(a) Draw a histogram to represent this information. [5]

(b) What is the greatest possible value of the interquartile range for the data? [2]

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(c) Calculate estimates of the mean and standard deviation of the number of chocolate bars sold.

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