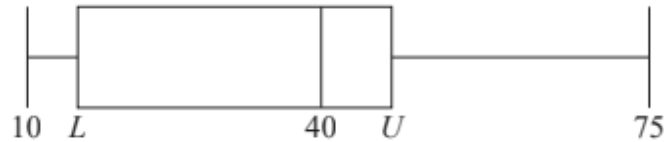


3. [Maximum mark: 5]

A research student weighed lizard eggs in grams and recorded the results. The following box and whisker diagram shows a summary of the results where L and U are the lower and upper quartiles respectively.

diagram not to scale



The interquartile range is 20 grams and there are no outliers in the results.

- (a) Find the minimum possible value of U . [3]
- (b) Hence, find the minimum possible value of L . [2]

3. [Maximum mark: 7]

The marks achieved by eight students in a class test are given in the following list.

8	4	7	6	10	9	7	3
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- (a) Find
- (i) the mean;
- (ii) the standard deviation. [2]
- (b) The teacher increases all the marks by 2. Write down the new value for
- (i) the mean;
- (ii) the standard deviation. [2]

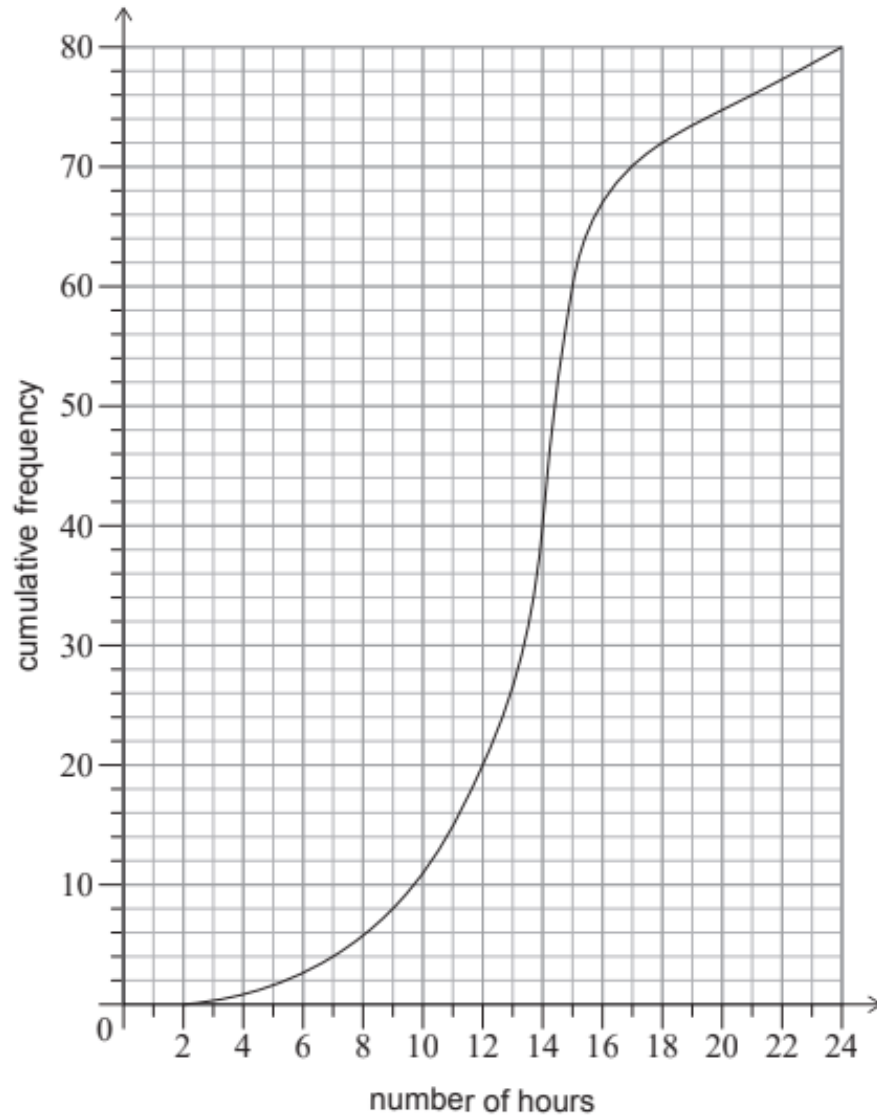
A ninth student also takes the test.

- (c) Explain why the median is unchanged. [3]

7. [Maximum mark: 14]

A large school has students from Year 6 to Year 12.

A group of 80 students in Year 12 were randomly selected and surveyed to find out how many hours per week they each spend doing homework. Their results are represented by the following cumulative frequency graph.



- (a) Find the median number of hours per week these Year 12 students spend doing homework. [2]
- (b) Given that 10% of these Year 12 students spend more than k hours per week doing homework, find the value of k . [3]

This same information is represented by the following table.

Hours (h) spent doing homework	$2 < h \leq 7$	$7 < h \leq 15$	$15 < h \leq 21$	$21 < h \leq 24$
Frequency	4	p	16	q

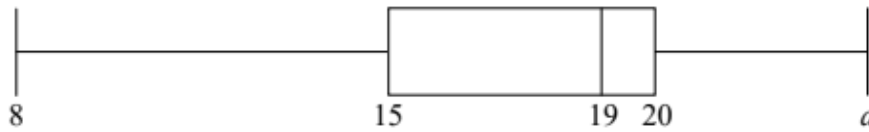
- (c) Find the value of p and the value of q . [4]

There are 320 students in Year 12 at this school.

- (d) Estimate the number of Year 12 students that spend more than 15 hours each week doing homework. [3]
- (e) (i) Explain why this sampling method might not provide an accurate representation of the amount of time **all** of the students in the school spend doing homework.
- (ii) Suggest a more appropriate sampling method. [2]

8. [Maximum mark: 16]

A group of 10 girls recorded the number of hours they spent watching television during a particular week. Their results are summarized in the box-and-whisker plot below.



- (a) The range of the data is 16. Find the value of a . [2]
- (b) Find the value of the interquartile range. [2]

The group of girls watched a total of 180 hours of television.

- (c) Find the mean number of hours that the girls in this group spent watching television that week. [2]

A group of 20 boys also recorded the number of hours they spent watching television that same week. Their results are summarized in the table below.

$\bar{x} = 21$	$\sigma = 3$
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- (d) (i) Find the total number of hours the group of boys spent watching television that week.
- (ii) Find the mean number of hours that **all 30** girls and boys spent watching television that week. [5]

The following week, the group of boys had exams. During this exam week, the boys spent half as much time watching television compared to the previous week.

- (e) For this exam week, find
- (i) the mean number of hours that the group of boys spent watching television;
- (ii) the variance in the number of hours the group of boys spent watching television. [5]