

# Stats 29.05 [67 marks]

1. A data set consisting of 16 test scores has mean 14.5. One test score of 9 requires a second marking and is removed from the data set. [4 marks]  
Find the mean of the remaining 15 test scores.

The number of hours spent exercising each week by a group of students is shown in the following table.

Exercising time (in hours)	Number of students
2	5
3	1
4	4
5	3
6	$x$

The median is 4.5 hours.

- 2a. Find the value of  $x$ . [2 marks]

- 2b. Find the standard deviation. [2 marks]

The fastest recorded speeds of eight animals are shown in the following table.

Animal	Speed (km h <sup>-1</sup> )
Golden eagle	300
Swordfish	97
Hare	80
Lion	80
Horse	71
Zebra	64
Komodo dragon	21
Tiger beetle	6

- 3a. State whether **speed** is a continuous or discrete variable. [1 mark]

3b. Write down the median speed for these animals.

[1 mark]

3c. Write down the range of the animal speeds.

[1 mark]

3d. For these eight animals find the mean speed.

[2 marks]

3e. For these eight animals write down the standard deviation.

[1 mark]

A florist sells bouquets of roses. The florist recorded, in **Table 1**, the number of roses in each bouquet sold to customers.

**Table 1**

<b>Number of roses in a bouquet (<math>n</math>)</b>	2	3	4	5	6	7	8	9	10	11	12
<b>Number of customers (<math>f</math>)</b>	9	2	4	5	7	3	10	2	3	1	4

The roses can be arranged into bouquets of size small, medium or large. The data from **Table 1** has been organized into a cumulative frequency table, **Table 2**.

**Table 2**

<b>Bouquet size</b>	<b>Number of roses (<math>n</math>)</b>	<b>Frequency (<math>f</math>)</b>	<b>Cumulative frequency</b>
small	$2 \leq n \leq 4$	15	
medium	$5 \leq n \leq 8$	25	
large	$9 \leq n \leq 12$		

4a. Complete the cumulative frequency table.

[2 marks]

4b. Write down the probability that a bouquet of roses sold is **not** small.

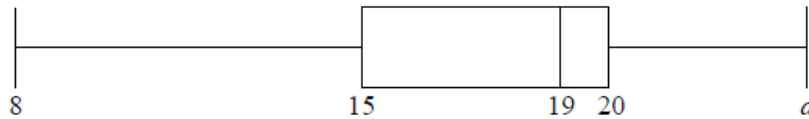
[2 marks]

4c. A customer buys a large bouquet.

[2 marks]

Find the probability that there are 12 roses in this bouquet.

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.



5a. The range of the data is 16. Find the value of  $a$ . *[2 marks]*

5b. Find the value of the interquartile range. *[2 marks]*

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

5c. Find the mean number of hours that the girls in this group spent watching television that week. *[2 marks]*

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.

$\bar{x} = 21$	$\sigma = 3$
----------------	--------------

5d. Find the total number of hours the group of boys spent watching television that week. *[2 marks]*

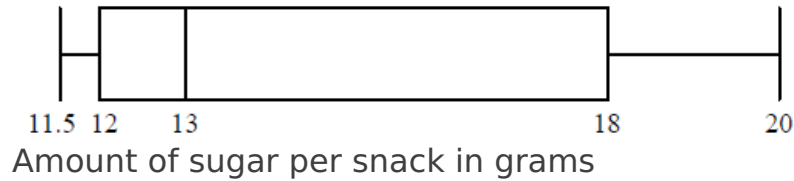
5e. Find the mean number of hours that **all 30** girls and boys spent watching television that week. *[3 marks]*

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.

For this exam week, find

5f. the mean number of hours that the group of boys spent watching television. *[2 marks]*

A health inspector analysed the amount of sugar in 500 different **snacks** prepared in various school cafeterias. The collected data are shown in the following box-and-whisker diagram.

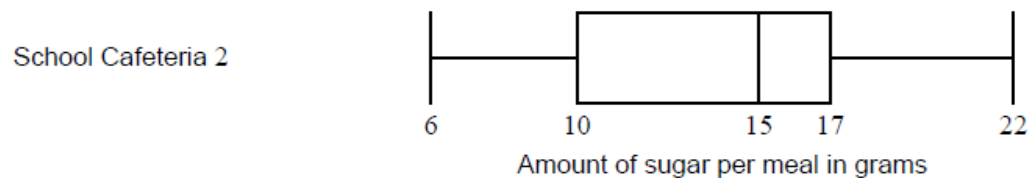
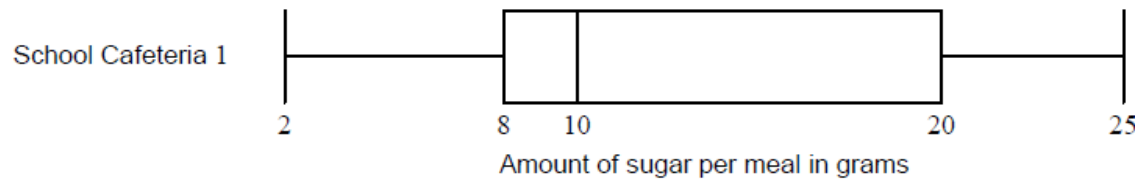


6a. State what 13 represents in the given diagram. [1 mark]

6b. Write down the interquartile range for this data. [2 marks]

6c. Write down the approximate number of snacks whose amount of sugar ranges from 18 to 20 grams. [1 mark]

6d. The health inspector visits two school cafeterias. She inspects the same number of **meals** at each cafeteria. The data is shown in the following box-and-whisker diagrams. [2 marks]



Meals prepared in the school cafeterias are required to have less than 10 grams of sugar.

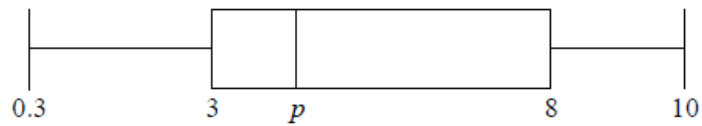
State, giving a reason, which school cafeteria has more meals that **do not** meet the requirement.

Ten students were asked for the distance, in km, from their home to school. Their responses are recorded below.

0.3 0.4 3 3 3.5 5 7 8 8 10

7a. For these data, find the mean distance from a student's home to school. [2 marks]

The following box-and-whisker plot represents this data.



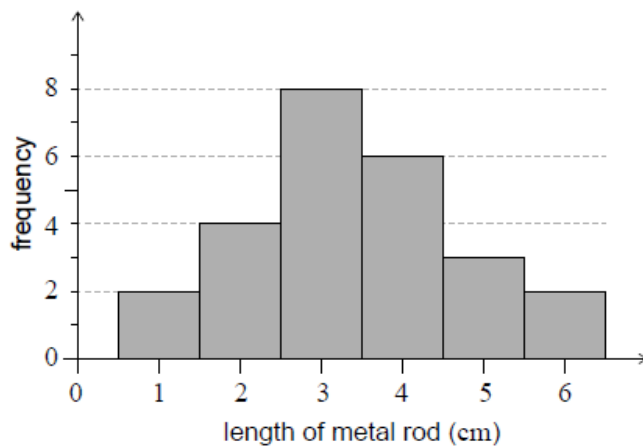
7b. Find the value of  $p$ .

[1 mark]

7c. Find the interquartile range.

[2 marks]

The histogram shows the lengths of 25 metal rods, each measured correct to the nearest cm.



8a. Write down the modal length of the rods.

[1 mark]

8b. Find the median length of the rods.

[3 marks]

The upper quartile is 4 cm.

8c. Calculate the lower quartile.

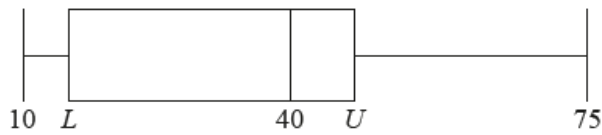
[1 mark]

8d. Calculate the interquartile range.

[1 mark]

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

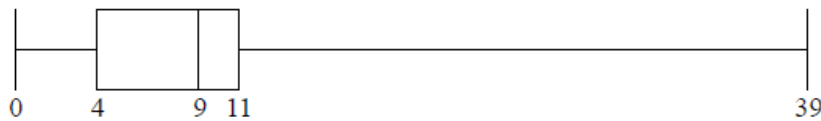


The interquartile range is 20 grams and there are no outliers in the results.

9a. Find the minimum possible value of  $U$ . [3 marks]

9b. Hence, find the minimum possible value of  $L$ . [2 marks]

The following box-and-whisker plot shows the number of text messages sent by students in a school on a particular day.



10a. Find the value of the interquartile range. [2 marks]

10b. One student sent  $k$  text messages, where  $k > 11$ . Given that  $k$  is an outlier, find the least value of  $k$ . [4 marks]

A data set has  $n$  items. The sum of the items is 800 and the mean is 20.

11a. Find  $n$ . [2 marks]

The standard deviation of this data set is 3. Each value in the set is multiplied by 10.

11b. Write down the value of the new mean. [1 mark]

11c. Find the value of the new variance. [3 marks]

