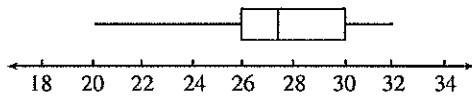




**Topic test 9: Analysing data *continued***

- 14 The six chefs at a restaurant earn the following weekly wages: \$520, \$610, \$610, \$630, \$660, \$710. How will another wage of \$400 affect the mean and standard deviation (SD) of this set of wages?
- A The mean and SD will both increase  
 B The mean and SD will both decrease  
 C The mean will increase and the SD will decrease  
 D The mean will decrease and the SD will increase

Questions 15 and 19 refer to the following box-and-whisker plot, which describes the number of hours worked per week by employees at a supermarket.



- 15 Find the interquartile range.
- A 4                                      B 2.5  
 C 1.5                                     D 27.5
- 16 Find the median.
- A 26                                      B 27.5  
 C 30                                      D cannot be determined
- 17 Find the mode.
- A 28                                      B 27.5  
 C 28.5                                   D cannot be determined
- 18 Find the range.
- A 12                                      B 27.5  
 C 4                                        D cannot be determined
- 19 If there are 48 employees at the supermarket, how many worked between 26 and 32 hours?
- A 8                                        B 36  
 C 24                                      D 12
- 20 Which measure is least affected by an outlier in the data set?
- A mode                                    B range  
 C standard deviation                D median

**Part B**

7 free-response questions  
 60 marks

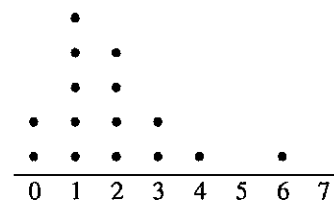
Show working where appropriate.

- 21 (8 marks) This stem-and-leaf plot lists the ages of people visiting a chemist in half an hour.

Stem	Leaf
0	3 7 8
1	2 5 6 9 9
2	4 7
3	0 4 5 6 6 7 8
4	2 5 8 8 8
5	0 1 7 7 8
6	3 4 8

Find:

- a the range
- b the mode
- c the median
- d the interquartile range
- 22 (6 marks) This dot plot shows the number of rainy days per week in Mudgee over a 15-week period.



- a Is this distribution symmetrical or skewed?
- b What is the outlier?
- c Where does the clustering occur?

**Topic test 9: Analysing data continued**

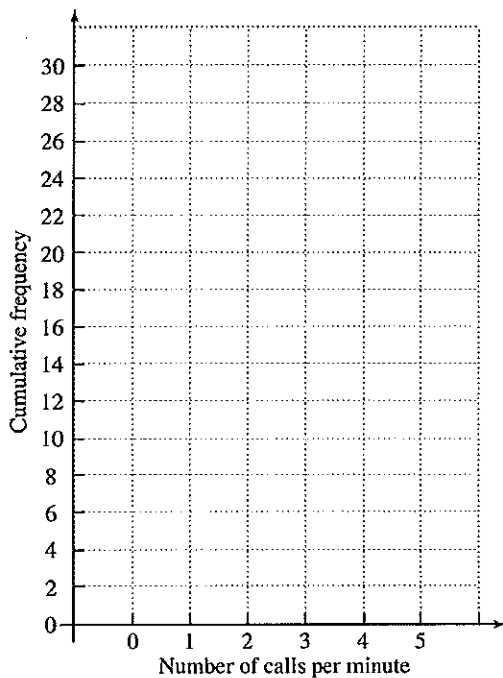
**23** (12 marks) The number of phone calls received per minute by a computer support line in a 30-minute period is shown below:

2 2 1 2 5 4 3 5 1 0 2 4 4 5 1  
0 3 4 5 5 3 0 0 2 4 4 5 3 4 2

a Complete this table.

Score	Frequency	Cumulative frequency
0	4	4
1		
2		
3	4	
4		
5		

b Construct a cumulative frequency histogram and polygon.



c Use the polygon to find the median.

d Use the polygon to find the interquartile range.

**24** (2 marks) Alice's average mark for five exams is 67%. In her next exam, she wants to improve her average to 70%. What mark must she obtain in her next exam to achieve this?

**25** (8 marks) Police radar measured the speeds (in km/h) of 40 vehicles. The results are shown in the frequency table below:

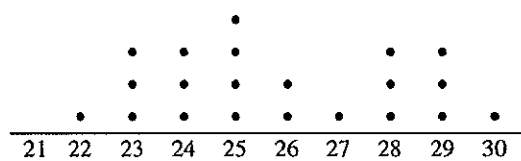
Class (km/h)	Class centre, $X$	Frequency, $f$	$fX$
70–79		2	
80–89		8	
90–99		9	
100–109		13	
110–119		8	
Totals			

a Complete the table.

b Find the modal class.

c Calculate an estimate for the mean.

**26** (10 marks) The daily temperatures (in °C) in Taree over 3 weeks are illustrated in this dot plot.



a Find the mean.

b Find the standard deviation.

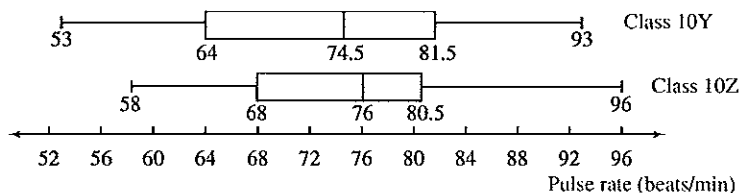
c Find the interquartile range.

d Find the median.

e Find the mode.

**Topic test 9: Analysing data *continued***

**27** (14 marks) Two PE classes of students have their pulse rates (in beats per minute) measured. The results are shown in these box-and-whisker plots.



- a What was the lowest pulse rate across both classes?
- b Find the median for class 10Y.
- c Find the interquartile range for class 10Z.
- d Find the range for class 10Z.
- e If there are 24 students in class 10Y, how many had a pulse rate between 74.5 and 93?
- f Which class had the higher pulse rate on average? How does the box-and-whisker plot show this?
- g Which class had more spread of pulse rates? How does the box-and-whisker plot show this?

**END OF TEST.**  
Use the rest of this page  
for extra working space.

**Topic test 9**

**Analysing data**



- Time allowed: 45 minutes
- Part A: 20 multiple-choice questions (40 marks)
- Part B: 7 free-response questions (60 marks)

Name: Renecia hane

**Part A**

20 multiple-choice questions  
2 marks each: 40 marks  
Circle the correct answer.

Questions 1 to 6 refer to the following data, which describe the ages of the students in a karate class.

21 14 13 16 16 15  
13 10 13 18 12 14 13 13 14 14 15  
*Handwritten notes: 13, 12, 13, 14, 15, 16, 18, 21*

- 1 Find the mean.  
A 13                                    B 14  
C 14.5                                 D  14.6
- 2 Find the standard deviation.  
 A 2.8                                    B 3  
C 4.8                                    D 2
- 3 Find the mode.  
 A 13                                    B 14  
C 14.5                                 D 14.6
- 4 Find the median.  
A 13                                    B  14  
C 14.5                                 D 14.6
- 5 Find the range.  
A 3                                    B 4  
 C 11                                    D 12
- 6 Find the interquartile range. *LQ = 12, HQ = 16*  
A 2                                    B 2.8  
 C 3                                    D 4.8
- 7 The number of children in a family is an example of:  
A categorical data                    B qualitative data  
C continuous data                    D  discrete data
- 8 Which one of these is *not* a measure of spread?  
A interquartile range                B  outlier  
C range                                 D standard deviation

- 9 The scores 4, 3, 7 and  $y$  have a mean of 4. What is the value of  $y$ ?  
A 4                                    B 3.5  
C 2.5                                 D  2

$$\frac{14+y}{4} = 4 \implies 14+y = 16 \implies y = 2$$

Questions 10 and 11 refer to the following frequency table, which describes the number of days 40 students bought their lunches at the school canteen last week.

Score	Frequency
0	4
1	2
2	6
3	10
4	11
5	7

- 10 Find the mode.  
A 2.5                                    B 3.1  
C 3                                    D  4
- 11 Find the mean.  
A 2.5                                    B  3.1  
C 3                                    D 4
- 12 Which one of these measures is *not* part of a five-point summary?  
A upper quartile                    B median  
C lower extreme                    D  standard deviation
- 13 Which one of these measures depends upon the value of *every* score in the data set?  
A mode  
B interquartile range  
C  standard deviation  
D  range

623.33  
57.7  
591.43  
94.6

**Topic test 9: Analysing data *continued***

14 The six chefs at a restaurant earn the following weekly wages: \$520, \$610, \$610, \$630, \$660, \$710. How will another wage of \$400 affect the mean and standard deviation (SD) of this set of wages?

- A The mean and SD will both increase
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Questions 15 and 19 refer to the following box-and-whisker plot, which describes the number of hours worked per week by employees at a supermarket.



- 15 Find the interquartile range.
- A 4
  - B 2.5
  - C 1.5
  - D 27.5
- 16 Find the median.
- A 26
  - B 27.5
  - C 30
  - D cannot be determined
- 17 Find the mode.
- A 28
  - B 27.5
  - C 28.5
  - D cannot be determined
- 18 Find the range.
- A 12
  - B 27.5
  - C 4
  - D cannot be determined
- 19 If there are 48 employees at the supermarket, how many worked between 26 and 32 hours?
- A 8
  - B 36 *75%*
  - C 24
  - D 12
- 20 Which measure is least affected by an outlier in the data set?
- A mode
  - B range
  - C standard deviation
  - D median

**Part B**

7 free-response questions  
60 marks

Show working where appropriate.

21 (8 marks) This stem-and-leaf plot lists the ages of people visiting a chemist in half an hour.

Stem	Leaf
0	3 7 8
1	2 5 6 8 9
2	4 7
3	8 4 8 6 7 8 9
4	2 5 8 8 8
5	0 1 1 1 1
6	1 1 1

Find:

a the range

$68 - 3 = 65$  ✓

b the mode

48 ✓

c the median

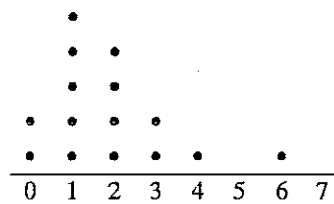
$\frac{34.5}{2} = 36.5$

(30 scores)  
15-16

d the interquartile range

$\frac{51 - 19}{2} = 32$

22 (6 marks) This dot plot shows the number of rainy days per week in Mudgee over a 15-week period.



a Is this distribution symmetrical or skewed?

positively skewed

b What is the outlier?

6

c Where does the clustering occur?

at 1 and 2 ✓

**Topic test 9: Analysing data *continued***

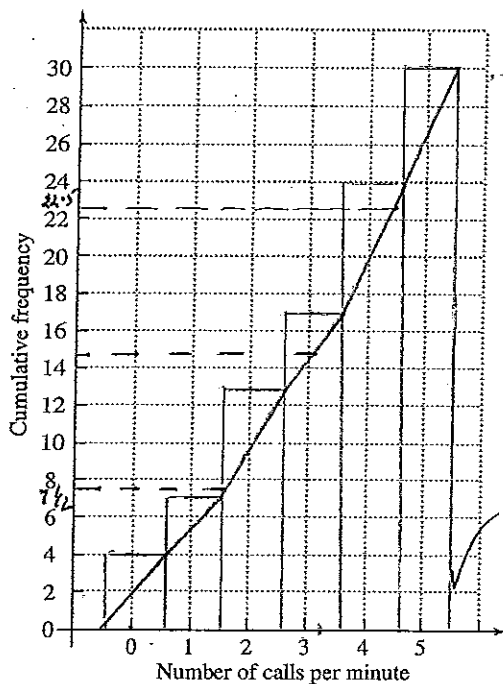
23 (12 marks) The number of phone calls received per minute by a computer support line in a 30-minute period is shown below:

2 2 1 2 5 4 3 5 1 0 2 4 4 5 1  
0 3 4 5 5 3 0 0 2 4 4 5 3 4 2

a Complete this table.

Score	Frequency	Cumulative frequency
0	4	4
1	3	7
2	6	13
3	4	17
4	7	24
5	6	30

b Construct a cumulative frequency histogram and polygon.



c Use the polygon to find the median.

median = 3 ✓

d Use the polygon to find the interquartile range.

UQ = 22.5 ✓  
LQ = 7.5 ✓  
interquartile range = 15 ✓  
2.

24 (2 marks) Alice's average mark for five exams is 67%. In her next exam, she wants to improve her average to 70%. What mark must she obtain in her next exam to achieve this?

$5 \times 67 = 335$  ✓  
 $335 + x = 420 \rightarrow (6 \times 70)$  ✓  
 $x = 85$  ✓

25 (8 marks) Police radar measured the speeds (in km/h) of 40 vehicles. The results are shown in the frequency table below:

Class (km/h)	Class centre, $X$	Frequency, $f$	$fX$
70-79	75	2	150
80-89	85	8	680
90-99	95	9	855
100-109	105	13	1365
110-119	115	8	920
Totals		40	3970

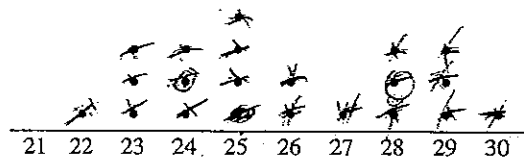
a Complete the table.

b Find the modal class. 100-109 ✓

c Calculate an estimate for the mean.

mean =  $99.25$  ✓  
approximately.

26 (10 marks) The daily temperatures (in °C) in Taree over 3 weeks are illustrated in this dot plot.



a Find the mean. = 25.9 (100%) ✓

b Find the standard deviation. = 2.34 (100%) ✓

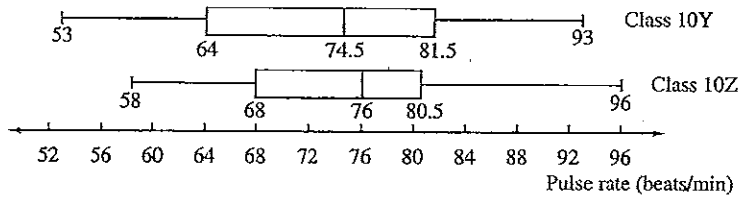
c Find the interquartile range. = 4 ✓

d Find the median. = 25 ✓

e Find the mode. = 25 ✓

**Topic test 9: Analysing data *continued***

27 (14 marks) Two PE classes of students have their pulse rates (in beats per minute) measured. The results are shown in these box-and-whisker plots.



a What was the lowest pulse rate across both classes?

~~58~~ 53

b Find the median for class 10Y. = 74.5 ✓

c Find the interquartile range for class 10Z. = 12.5 ✓

d Find the range for class 10Z. = ~~40~~ 96 - ~~58~~ = 38

e If there are 24 students in class 10Y, how many had a pulse rate between 74.5 and 93? 12 students ✓

f Which class had the higher pulse rate on average? How does the box-and-whisker plot show this? Class 10Z - ~~over~~ (represented by interquartile range) is higher

g Which class had more spread of pulse rates? How does the box-and-whisker plot show this? Class 10Y - greater interquartile range

END OF TEST.

Use the rest of this page for extra working space.