

Name _____

Date _____

Stage 7 End-of-unit test 16 — mark scheme

22 questions · 50 marks · calculators are not allowed · allow about 45 minutes

- 1 Find the mode of 6, 9, 4, 9, 12, 9, 7. [2]

Answer: 9

9 appears three times, more than any other value.

- 2 Find the median of 6, 9, 4, 9, 12, 9, 7. [2]

Answer: 9

In order: 4, 6, 7, 9, 9, 9, 12. There are 7 values, so the median is the 4th, which is 9.

- 3 Find the range of 6, 9, 4, 9, 12, 9, 7. [2]

Answer: 8 $12 - 4 = 8$.

- 4 Find the mean of 6, 9, 4, 9, 12, 9, 7. [3]

Answer: 8 $6 + 9 + 4 + 9 + 12 + 9 + 7 = 56$, and $56 \div 7 = 8$.

- 5 Find the median of 4, 10, 6, 14, 8, 12. [3]

Answer: 9In order: 4, 6, 8, 10, 12, 14. There are 6 values, so take the middle two, 8 and 10: $8 + 10 = 18$, then $18 \div 2 = 9$.

- 6 Six numbers have a mean of 14. What is their total? [2]

Answer: 84Total = mean $\times$ how many: $14 \times 6 = 84$.

- 7 Five numbers have a mean of 20. Four of them are 15, 18, 22 and 25. What is the fifth? [4]

Answer: 20The total must be $20 \times 5 = 100$. The four given add to $15 + 18 + 22 + 25 = 80$, so the fifth is $100 - 80 = 20$.

- 8 Which average is most appropriate for the favourite colour of a class? [2]

☐ mode☐ median☐ mean☐ none of them**Answer: mode**

The data is words, and only the mode works for words.

- 9 Which average is most appropriate for house prices on a street where one house is far more expensive than the rest? [2]
- ☐ mode
 - ☐ median
 - ☐ mean
 - ☐ none of them

Answer: median

The outlier would drag the mean up so far that it described no house on the street.

- 10 Which average is affected most by an outlier? [2]
- ☐ mode
 - ☐ median
 - ☐ mean
 - ☐ they are all affected equally

Answer: mean

It uses every value, so an extreme one counts in full.

- 11 The set 5, 6, 7, 6, 50 contains an outlier. What is the mean with it removed? [3]

Answer: 6

Without 50: $5 + 6 + 7 + 6 = 24$, and $24 \div 4 = 6$.

- 12 What does the range tell you? [1]
- ☐ The typical value
 - ☐ How spread out the data is
 - ☐ The most common value
 - ☐ The total

Answer: How spread out the data is

It is a measure of spread, not an average.

- 13 A pie chart shows 24 people. How many degrees does one person represent? [2]

Answer: 15

$360 \div 24 = 15^\circ$.

- 14 In that pie chart, one sector is 105° . How many people does it represent? [3]

Answer: 7

$105 \div 15 = 7$ people.

- 15 A category is 30% of a pie chart. What is its angle, in degrees? [3]

Answer: 108

30% of 360 is $0.3 \times 360 = 108^\circ$.

- 16 A bar chart shows 14, 9, 17 and 20. What is the total? [2]

Answer: 60

$14 + 9 + 17 + 20 = 60$.

- 17 Why should a bar chart's vertical scale start at zero? [2]

- ☐ It looks better
- ☐ Otherwise small differences look far bigger than they are
- ☐ The bars would not fit
- ☐ It need not

Answer: Otherwise small differences look far bigger than they are

A truncated scale is the classic misleading graph.

18 Which chart is best for showing change over time? [1]

- ☐ pie chart
- ☐ bar chart
- ☐ line graph
- ☐ tally chart

Answer: line graph

The joined points show the trend.

19 Class A scores have range 3 and class B have range 14. Which class is more consistent? Answer 1 for A and 2 for B. [2]

Answer: 1

A smaller range means the scores are packed closer together, so class A is the more consistent.

20 To compare two data sets properly you should quote ... [2]

- ☐ an average only
- ☐ a range only
- ☐ an average and a range
- ☐ the totals

Answer: an average and a range

One says what is typical, the other how much it varies.

21 A survey asks only people leaving a sports centre how much they exercise. The problem is that the sample is ... [2]

- ☐ too large
- ☐ biased
- ☐ too old
- ☐ fine

Answer: biased

Those people are not typical of everybody, so no amount of correct arithmetic will make the conclusion right.

22 Sales rose for six months and fell in the seventh. What should you conclude? [3]

- ☐ The trend has ended
- ☐ One month is not enough to say the trend has changed
- ☐ Sales will keep falling
- ☐ The data is wrong

Answer: One month is not enough to say the trend has changed

A trend is about the general direction, not a single step.

Total: 50 marks