GRADEUP

AQA (GCSE Notes)

Chapter 6: Statistics

Q1. A random sample of 40 students was taken from a school of 500 students. Why might the sample not fully represent the whole school?

Q2. A survey was done using a sample of 100 people from a town. Explain one limitation of using this sample to represent the views of the entire town.

Q3. A student wants to investigate how much time people spend on homework. She chooses a sample of 10 friends. Explain why this sample might not be suitable.

Q4. A company takes a sample of 50 products from a batch of 2000. Explain one reason why they take a sample instead of checking every product.

Q5. A bar chart shows the number of pets owned by children in different classes. Describe one thing you can learn from the chart.

Q6. A pie chart shows how a family spends its income. Describe how to work out the amount spent on rent if the angle is 90°.

Q7. A frequency table shows how many hours students revise for a test. Explain how to find the modal class.

Q8. A vertical line chart shows the number of goals scored in 10 football matches. How would you describe the spread of the data?

Q9. A pictogram shows how many books were read by students in each month. Describe how to interpret a symbol that represents 5 books.

Q10. A time series graph shows daily temperatures over a month. Describe one trend you can see from the graph.

Q11. A line graph shows a company's profit over a year. What does a downward slope on the graph tell you?

Q12. Draw a frequency table for the following data: 5, 7, 8, 7, 6, 5, 5, 8, 7, 6.

Q13. Construct a bar chart for the number of rainy days in each week of a month: 3, 2, 5, 4.

Q14. A pie chart has a 72° angle for one category. What fraction of the whole does this represent?

Q15. A student records the number of push-ups done daily for a month. Suggest a suitable chart or graph to represent the data.

GRADEUP

Q16. A histogram shows the weight of people with class intervals of 10kg. Explain how the height of each bar is decided.

Q17. A histogram has unequal class intervals. Explain how the frequency density is calculated.

Q18. Draw a histogram for this data: 0–10 (4), 10–20 (8), 20–30 (12), 30–50 (16).

Q19. A grouped frequency table shows the time taken to run a race. Explain how to estimate the mean time.

Q20. A cumulative frequency graph is plotted for the height of students. Describe how to find the median from the graph.

Q21. A cumulative frequency graph is used to estimate the interquartile range. Describe how to do this.

Q22. A box plot shows the test scores of two classes. How can you compare the spread of scores between the classes?

Q23. A box plot shows an outlier. Explain what an outlier is and how it can affect the data.

Q24. A dataset has values: 3, 4, 6, 8, 9. Find the range and explain what it tells you.

Q25. Explain how to find the median from a set of 11 ordered numbers.

Q26. A frequency table shows the ages of people in a club. Explain how to find the mean age.

Q27. A group of students record their walking times. Explain how to find the modal class.

Q28. A bar chart shows the favourite subjects of students. Explain how you can tell which subject is most popular.

Q29. A student makes a pie chart from data collected. Explain why all the angles should add up to 360°.

Q30. Explain why box plots are useful for comparing two data sets.

Q31. A grouped frequency table has class intervals 0–10, 10–20, and so on. Explain why you can't find the exact mean.

Q32. Explain how to use midpoints when estimating the mean from grouped data.

Q33. A histogram shows the number of cars passing a junction in different time intervals. Explain why histogram bars are drawn without gaps.

Q34. A student wants to make a cumulative frequency graph. What values should they plot on the y-axis?

Q35. Explain how to calculate the upper and lower quartiles from a list of data.

Q36. A box plot has a long whisker on the right. What does this suggest about the distribution of the data?

Q37. A set of data has a mean of 20 and a range of 50. What does this tell you about the spread of the data?

Q38. Explain why the median is sometimes a better measure than the mean.

Q39. A set of data has a mode of 15. What does this tell you?

Q40. A bar chart shows the number of people choosing different drinks. Two bars are the same height. What does this mean?

Q41. A frequency table shows 100 students and how many use a certain app. Explain how to calculate the percentage who use it.

Q42. A pie chart shows transport methods. The 'bus' section is 120°. What does this angle represent in terms of the whole group?

Q43. A student calculates the interquartile range as 12. What does this number tell you about the data?

Q44. A data set contains an outlier that is much higher than the rest. What effect does this have on the mean and median?

Q45. A time series graph shows sales increasing steadily. What can this trend suggest for the future?

Q46. A line graph shows a sudden drop in values. Give two possible reasons for this change.

Q47. A grouped frequency table is missing the class 20–30. Explain how this affects the results.

Q48. A student draws a histogram with incorrect bar widths. Explain how this affects interpretation.

Q49. A set of test scores has a mean of 65 and a range of 5. What does this tell you about the scores?

Q50. A box plot shows the test results of two groups. One has a larger interquartile range. What does this tell you about that group?

Q51. Draw a scatter graph for the following pairs of values:
(2, 5), (3, 7), (4, 8), (5, 11), (6, 13), (7, 14).
Describe the type of correlation.

Q52. The test scores of 15 students are:
34, 45, 50, 52, 56, 58, 60, 61, 65, 67, 70, 73, 75, 78, 80.
Draw a box plot to represent this data.

Q53. The number of hours studied and the corresponding test scores for six students are:
(1, 35), (2, 40), (3, 50), (4, 55), (5, 65), (6, 70).
Plot these values on a scatter graph. What type of correlation is shown?

Q54. The ages of a group of people are:
23, 25, 26, 27, 28, 29, 30, 90.
Explain how the outlier affects the mean and the median.

Q55. A grouped frequency table shows the marks of 30 students:
0–10: 3 students
10–20: 7 students
20–30: 10 students
30–40: 6 students
40–50: 4 students
Draw a cumulative frequency graph and estimate the median.

Q56. The following values represent test scores:
44, 49, 53, 56, 59, 60, 61, 62, 64, 65, 66
Draw a box plot and calculate the interquartile range.

Q57. Given this grouped frequency table, estimate the mean:

Class Interval	Frequency
0 - 10	5
10 - 20	8
20 - 30	12
30 - 40	5

Q58. Write whether each of the following is discrete or continuous data and explain:
Number of books read, temperature, height, number of pets.

Q59. Compare a bar chart and a histogram using this data:
Number of people with shoe sizes:
Size 5: 2
Size 6: 4
Size 7: 6
Size 8: 5
Explain which graph is appropriate and why.

Q60. The ages of 12 students are:
13, 14, 14, 14, 15, 15, 16, 16, 17, 17, 18, 18.
Represent this data using a stem-and-leaf diagram.

Q61. The following data shows a relationship between hours revised and exam marks:
(1, 35), (2, 42), (3, 47), (4, 56), (5, 64), (6, 70).
Draw a scatter graph and add a line of best fit. Predict the score for 7 hours of revision.

Q62. A school has 1,200 students. A sample of 120 is taken to investigate lunch preferences.
Explain the difference between population and sample in this case.

Q63. Given the frequency table:

Score	Frequency
1	2
2	5
3	8
4	3
5	2

Find the median score.

Q64. A set of data has the following values:
2, 2, 2, 5, 7, 9, 10
Discuss whether mode or mean is more appropriate as a measure of average.

Q65. Given the data:
(2, 12), (4, 20), (6, 25), (8, 32), (10, 39)
Plot a scatter graph and state if there is correlation. If yes, what kind?

Q66. Use this grouped data to draw a cumulative frequency curve:
0–20: 4
20–40: 10
40–60: 8

60–80: 6
80–100: 2
Estimate the median and upper quartile.

Q67. The ages of ten people are:
22, 23, 24, 25, 26, 27, 28, 29, 30, 31
Find the interquartile range and explain what it tells you about the spread.

Q68. A population is very large. Explain why a random sample of 100 is more practical than using the whole population.

Q69. The frequency table is:

GRADEUP

Interval	Frequency
0 - 10	4
10 - 20	6
20 - 30	10
30 - 40	5

Explain how to draw a histogram with unequal class widths.

Q70. A scatter graph shows the values:
(1, 10), (2, 9), (3, 8), (4, 7), (5, 6)
Draw the graph and describe the type of correlation.

Q71. Calculate the range, mean, median, and mode for the following numbers:
6, 8, 8, 10, 12, 14, 16

Q72. Box plots for Class A and Class B show the same median but different interquartile ranges.
Explain what this tells you about the spread of scores.

Q73. Scatter graphs for two different data sets show different patterns.
One is tightly clustered along a line, the other is more spread out.
Describe the strength of correlation in both graphs.

Q74. A set of data includes:
1, 1, 1, 2, 2, 3, 3, 25
Explain whether the mean or median gives a better representation of the data.

Q75. The following scatter graph shows height (cm) against shoe size.
Explain how the line of best fit can be used to estimate the shoe size of someone who is 175 cm tall.

Q76. The number of books read by 20 students last month is recorded.
Present the data using a bar chart.
Number of books: 0, 1, 2, 3, 4, 5
Frequencies: 2, 3, 7, 4, 2, 2

Q77. Use the data below to draw a cumulative frequency graph and estimate the lower quartile.

Interval	Frequency
0 - 10	3
10 - 20	5
20 - 30	9

30 - 40	8
40 - 50	8

Q78. Why are the mean, median, and mode useful when comparing two different data sets?

Q79. Two data sets have the same mode but very different ranges.
Explain what this tells you about the distributions.

Q80. The heights (cm) of students are recorded as:
150, 153, 154, 155, 160, 162, 163, 170, 174
Is this data discrete or continuous? Explain.

Q81. The points plotted on a scatter graph are:
(1, 5), (2, 6), (3, 5), (4, 6), (5, 5)
Describe the type of correlation and what it suggests.

Q82. Two box plots show final exam scores for Group A and Group B.
Group A has a wider range and lower median.
What can you conclude about the performance of both groups?

Q83. The grouped data below shows the time taken (in minutes) to complete a task:

Time	Frequency
0 - 10	2
10 - 20	5
20 - 30	9
30 - 40	3

Draw a histogram to represent this data.

Q84. A survey only includes people from one school.
Explain why the sample may be biased when making conclusions about all students in the city.

Q85. The data values are:
12, 15, 17, 20, 22, 25, 30, 32
Find the lower and upper quartiles and describe why quartiles are useful.

Q86. The ages of 11 people are:
21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31
Calculate the interquartile range.

Q87. The points plotted are:
(1, 2), (2, 4), (3, 6), (4, 8), (5, ?)
Use a line of best fit to predict the missing value.

Q88. On a scatter graph, the points lie close to a straight line.
Explain what this tells you about the relationship between the variables.

Q89. The data below is about students' favourite colours:
Red: 5, Blue: 10, Green: 6, Yellow: 3
Explain why a bar chart is better than a histogram in this case.

Q90. A box plot shows a very high maximum value compared to the rest of the data.
What might this indicate?

Q91. A population of 1,000 workers is surveyed.
Describe how to randomly select a fair sample of 100.

Q92. Given the cumulative frequency table:

Marks	Cumulative Frequency
10	2
20	6
30	13
40	20
50	25

Estimate the median mark.

Q93. The scores are:
11, 14, 18, 19, 25, 27, 29
Calculate the range and explain what it shows.

Q94. The data is:
2, 2, 2, 3, 4, 100
Would you use the mean or the median as the average? Explain why.

Q95. A box plot shows the lower quartile close to the median but a large upper quartile.
What does this suggest about the data?

Q96. From this frequency table, find the mean:

Marks	Cumulative Frequency

1	2
2	3
3	5
4	4

Q97. Two data sets have the same mean but different interquartile ranges.
What does this tell you about the consistency of the data?

Q98. Define a representative sample and explain why it's important in data collection.

Q99. A scatter graph shows the values:
(2, 4), (3, 6), (4, 8), (5, 10), (6, 12)
Describe the type of correlation and what it tells you.

Q100. A national survey is too expensive to conduct for the entire population.
Explain why a sample is used and how to ensure it's unbiased.