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| Year  9 | | Mathematics Test  Data Comparison and Sampling | | Calculator Allowed |
| Short Answer Section | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Write all working and answers in the spaces provided on this test paper. | | | |
|  | **Questions 1 - 3 refer to the dot plots below which show the number of shots taken on each hole by two brothers in a nine hole game.**   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | Evan | | | |  |  |  |  |  | Steve | | |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  | O |  |  |  |  |  |  |  |  |  | O |  |  | |  | O | O | O |  |  |  |  |  |  |  | O | O | O |  | |  | O | O | O | O |  |  | O |  |  | O | O | O | O | O | |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 |  |  | 2 | 3 | 4 | 5 | 6 | | | | |
| 1. | Which brother had the highest mean and what was it?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 2. | Compare the mode and median of the two brother’s scores.  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 3. | Use statistical measures and terminology to compare the performance of the two brothers.    ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 4. | |  |  | | --- | --- | | Climate Zone | Number of Capital Cities | | Temperate | 5 | | Subtropical | 2 | | Tropical | 1 |   Hanna collects information about the climate in capital cities. What type of data is this?    .........................................................................................................................................    ................................................................................................................................................ | | | |
| 5. | Explain why you could not find the mean of the data in question 4.  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 6. | A clothing manufacturer collects data about shirt sizes by measuring a representative sample of males.  The results are shown in the table.  Would the mean, median or mode be of most use to the manufacturer? Explain your answer.     |  |  | | --- | --- | | Size | Frequency | | 36 | 4 | | 38 | 6 | | 40 | 8 | | 42 | 12 | | 44 | 6 | | 46 | 3 |   ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 7. | |  |  | | --- | --- | | Score | Frequency | | 95 | 2 | | 96 | 4 | | 97 | 7 | | 98 | 8 | | 99 | 6 | | 100 | 3 |   The results of a target shooting competition by two **Muzzle Club Stock Club**  clubs are shown in the tables.   |  |  | | --- | --- | | Score | Frequency | | 95 | 1 | | 96 | 3 | | 97 | 9 | | 98 | 10 | | 99 | 5 | | 100 | 2 |   Find the mean for each set of data and compare  them.  ......................................................................  .......................................................................  ...................................................................... | | | |
| 8. | Use your answers to question 7 (and any other statistical measures) to compare the performances of the two clubs on the competition in question 7.  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
|  | **Questions 9 and 10 refer to the following.**  The back to back stem and leaf plot compares the ages of the owners of two makes of car.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Spyder | | | | | Stem | Tyger | | | | | |  |  |  | 4 | 2 | 2 | 9 |  |  |  |  | |  |  | 4 | 3 | 0 | 3 | 5 | 8 |  |  |  | | 8 | 5 | 3 | 3 | 1 | 4 | 2 | 3 | 3 | 5 |  | |  |  | 5 | 3 | 2 | 5 | 3 | 4 | 5 | 5 | 8 | |  |  |  | 5 | 1 | 6 | 1 | 3 | 4 |  |  | | | | |
| 9. | By how much do the median ages differ for the two cars?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |
| 10. | By how much do the mean ages differ for the two cars?  ..........................................................................................................................................................    .......................................................................................................................................................... | | | |

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|  | **Questions 11 – 14 refer to the following.**  The table and the graph below show the number of matches in a sample of 30 boxes from two different brands. |
| 11. | Complete the back to back histogram, using the data from the table.   |  |  | | --- | --- | | Strike Brand | | | Number of Matches in Box | Frequency | | 46 | 2 | | 47 | 4 | | 48 | 4 | | 49 | 6 | | 50 | 4 | | 51 | 6 | | 52 | 4 | |
| 12. | Find the mode for each brand of matches.  ..........................................................................................................................................................    .......................................................................................................................................................... |
| 13. | Find the mean for each brand of matches.  ..........................................................................................................................................................    .......................................................................................................................................................... |
| 14. | Comment on the distribution of matches for the two brands, referring to statistical terms and measures.  ..........................................................................................................................................................    .......................................................................................................................................................... |

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| Year  9 | | Mathematics Test  Data Comparison and Sampling | | Calculator Allowed |
| Multiple Choice Section | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section. | | | |
| 1. | Which of the following sets of data could be collected by observation?  A. weekly incomes of Perth residents.  B. body masses of Hobart residents.  C. daily temperatures at a Sydney residence.  D. monthly rentals at Melbourne residences. | | | |
| 2. | A sample group of students are chosen to answer questions in a survey about issues at a school.  Which is an example of a representative random sample of students?  A. the tenth person on each of the girls PE rolls is asked.  B. every student who attends Gauss High School is asked.  C. the tenth boy and the tenth girl in every class during period 1 is asked.  D. every student in year 9 at Gauss High School is asked. | | | |
| 3. | Which of these methods would be the best to give an unbiased sample when collecting data on political opinions in Queensland?  A. Randomly select 1 000 residents of the city of Brisbane.  B. Randomly select 500 male and 500 female residents of the city of Brisbane.  C. Randomly select 1 000 residents from Brisbane and country areas of Queensland.  D. Randomly select 500 male and 500 female residents from Brisbane and country areas. | | | |
|  | **Questions 4 and 5 refer to the following.**  Anastasia collects information from the internet on annual rainfall for Australian capital cities. She presents her results on the graph shown. | | | |
| 4. | Which city had about half of the annual rainfall of Darwin?  A. Brisbane. B. Melbourne. C. Perth. D. Sydney. | | | |
| 5. | The data collected for the rainfall of each city could be described as:  A. Categorical. B. Continuous Quantitative.  C. Discrete Quantitative. D. Random. | | | |
|  | **Questions 6 and 7 refer to the following.**  The back to back histogram compares the marks of the classes taught by Mr Bernoulli and Ms Euler. | | | |
| 6. | Which is **not** true?  A. Ms Euler’s class results were skewed.  B. Mr Bernoulli’s class results were symmetric.  C. Mr Bernoulli’s class results were bi-modal.  D. Ms Euler’s class results were bi-modal. | | | |
| 7. | Which class would have the median equal to the mean?  A. Mr Bernoulli’s B. Ms Euler’s C. Both classes D. Neither class. | | | |
|  | **Questions 8 – 10 refer to the following.**  The ages of those attending the Brown and Green family reunions are shown on the back to back stem and leaf plot.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Brown | | | | | | | Stem | Green | | | | | | | |  |  |  |  |  |  | 6 | 0 | 5 | 6 | 9 |  |  |  |  | |  |  |  |  |  | 7 | 4 | 1 | 3 | 5 | 6 | 8 |  |  |  | |  |  | 9 | 8 | 6 | 6 | 2 | 2 | 0 | 2 | 5 | 5 | 8 | 9 |  | | 9 | 8 | 8 | 8 | 7 | 7 | 5 | 3 | 1 | 3 | 5 | 5 |  |  |  | |  |  | 8 | 6 | 4 | 3 | 0 | 4 | 2 | 6 | 7 |  |  |  |  | | | | |
| 8. | Which distribution is skewed?  A. the Brown data. B. the Green data.  C. both sets of data. D. neither set of data. | | | |
| 9. | Which statement is true?  A. The two sets of data have the same range but the Greens median is higher by 12.  B. The two sets of data have the same range but the Browns median is higher by 12.  C. The two sets of data have the same median but the Greens range is higher by 12.  D. The two sets of data have the same median but the Browns range is higher by 12. | | | |
| 10. | Which family’s set of data has the mean approximately equal to the median?  A. the Brown family. B. the Green family.  C. both families. D. neither family. | | | |

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| Year  9 | | | Mathematics Test  Data Comparison and Sampling | | Calculator Allowed |
| Longer Questions | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
|  | Write all working and answers in the spaces provided on this test paper.  Calculators are allowed for this section. | | | | |
| 1. | The grouped frequency distribution gives the hours spent on completing a class project.     |  |  |  |  |  | | --- | --- | --- | --- | --- | | Class | Class Centre *x* | Frequency *f* | *fx* | Cumulative *f* | | 1 – 6 | 3.5 | 4 |  |  | | 7 – 12 | 9.5 | 6 |  |  | | 13 – 18 |  | 8 |  |  | | 19 – 24 |  | 2 |  |  | |  |  |  |  |  | | | | | |
|  | (a)  4 marks | Complete the table above. | | | |
| (b)  1 mark | Calculate the mean number of hours spent on the project.  ....................................................................................................................................................    ...................................................................................................................................................... | | | |
| (c)  3 marks | Draw the cumulative frequency polygon (ogive) for the data. | | | |
|  | (d)  1 mark | Estimate the median using the ogive.  .................................................................................................................................................... | | | |

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| Year  9 | Mathematics Test  Data Comparison and Sampling | |  |
| Multiple Choice  Answer Sheet | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

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|  | Mathematics Test  Data Comparison and Sampling |
| Answer Sheet |

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| Short Answer | | | |
| 1 |  | | |
| 2 |  | Evan | Steve |
| Mode | 3 | 4 |
| Median | 3 | 4 |
| Steve had the higher median and mode. | | |
| 3 | Evans scores were skewed toward the lower scores (positive skew) as indicated by lower mean, median and mode, but he did have a high outlier.  Steves scores were symmetrical about 4 with no outliers. | | |
| 4 | Categorical | | |
| 5 | There are no scores to find the mean of, only categories. | | |
| 6 | Mode would tell him which size was needed most. | | |
| 7 | Both have the same mean of 97.7 | | |
| 8 | Both had medians and modes of 98 and ranges of 5. The Stock club was slightly more clustered around the mean. | | |
| 9 | Differ by 10.  Tyger 53. Spyder 43 | | |
| 10 | Differ by 5.9.  Tyger 49.2. Spyder 43.3 | | |
| 11 | See graph at right. | | |
| 12 | Strike has modes of 49 &51  Ranga has mode of 50 | | |
| 13 | Strike 49.3  Ranga 49.6 | | |
| 14 | Both are slightly skewed (negatively). Strike is also bimodal. | | |

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| Multiple Choice | |
| 1 | C |
| 2 | C |
| 3 | D |
| 4 | C |
| 5 | B |
| 6 | D |
| 7 | A |
| 8 | A |
| 9 | B |
| 10 | B |

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| Longer Questions | Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Write all working and answers in the spaces provided on this test paper.  Calculators are allowed for this section. | | | |
| The grouped frequency distribution gives the hours spent on completing a class project.     |  |  |  |  |  | | --- | --- | --- | --- | --- | | Class | Class Centre *x* | Frequency *f* | *fx* | Cumulative *f* | | 1 – 6 | 3.5 | 4 | 14 | 4 | | 7 – 12 | 9.5 | 6 | 57 | 10 | | 13 – 18 | 15.5 | 8 | 124 | 18 | | 19 – 24 | 21.5 | 2 | 43 | 20 | |  |  | 20 | 238 |  | | | | |
| Complete the table above. | | |
| Calculate the mean number of hours spent on the project. | | |
| Draw the cumulative frequency polygon (ogive) for the data. | | |
| Estimate the median using the ogive.  Median = 12.5 | | |