**Topic: Interpret graphs, tables, data and distributions**

Time: 45 mins Marks: /45 marks

**No calculator allowed**



**Question One: [2, 2, 1, 2: 8 marks]**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Household Use of Information Technology, Australia** | | | | | | | | | |
| **Table 1: Households with access to a home computer, by period 2001 to 2008–09** | | | | | | | | | |
|  | **2001** | **2002** | **2003** | **2004–05** | **2005–06** | **2006–07** | **2007–08** | **2008–09** | |
| **NUMBER OF HOUSEHOLDS ('000)** | | | | | | | | | |
| **Households** | | | | | | | | | |
| Without children under 15 | 2,636 | 2,842 | 3,179 | 3,388 | 3,614 | 3,909 | 4,171 | | 4,313 |
| With children under 15 | 1,675 | 1,714 | 1,860 | 1,878 | 1,913 | 1,951 | 2,002 | 2,086 | |
| **State or Territory** | | | | | | | | | |
| New South Wales | 1,435 | 1,528 | 1,653 | 1,723 | 1,822 | 1,918 | 2,049 | 2,047 | |
| Victoria | 1,108 | 1,144 | 1,278 | 1,306 | 1,361 | 1,435 | 1,528 | 1,605 | |
| Queensland | 776 | 822 | 957 | 1,026 | 1,092 | 1,159 | 1,214 | 1,283 | |
| South Australia | 346 | 355 | 390 | 409 | 429 | 451 | 462 | 484 | |
| Western Australia | 427 | 479 | 512 | 545 | 560 | 613 | 626 | 673 | |
| Tasmania | 96 | 98 | 111 | 119 | 121 | 131 | 136 | 141 | |
| Northern Territory | 28 | 34 |  | 38 | 41 | 46 | 47 | 50 | |
| Australian Capital Territory | 94 | 96 | 99 | 99 | 101 | 108 | 111 | 116 | |
| **Region** | | | | | | | | | |
| Metropolitan areas | 2,928 | 3,091 | 3,349 | 3,455 | 3,655 | 3,848 | 4,000 | 4,161 | |
| Ex-metropolitan areas | 1,383 | 1,465 | 1,689 | 1,810 | 1,872 | 2,013 | 2,173 | 2,238 | |
| Total households with access to a home computer | 4,311 | 4,556 | 5,038 | 5,266 | 5,527 | 5,860 | 6,173 | 6,399 | |
| **Total households in Australia** | **7,377** | **7,468** | **7,633** | **7,847** | **7,945** | **8,071** | **8,244** | **8,189** | |
| **PROPORTION OF ALL HOUSEHOLDS WITH CHARACTERISTIC (%)** | | | | | | | | | |
| **Households** | | | | | | | | | |
| Without children under 15 | 51 | 53 | 58 | 60 | 63 | 67 | 69 | 73 | |
| With children under 15 | 77 | 79 | 85 | 84 | 87 | 88 | 90 | 91 | |
| **State or Territory** | | | | | | | | | |
| New South Wales | 59 | 61 | 65 | 67 | 69 | 72 | 76 | 77 | |
| Victoria | 61 | 62 | 68 | 68 | 69 | 72 | 74 | 78 | |
| Queensland | 55 | 57 | 65 | 67 | 72 | 74 | 75 | 80 | |
| South Australia | 56 | 58 | 62 | 64 | 67 | 69 | 71 | 75 | |
| Western Australia | 58 | 63 | 67 | 69 | 71 | 76 | 76 | 81 | |
| Tasmania | 50 | 51 | 57 | 61 | 60 | 66 | 67 | 71 | |
| Northern Territory | 52 | 62 |  | 71 | 70 | 75 | 77 | 80 | |
| Australian Capital Territory | 77 | 78 | 80 | 79 | 82 | 84 | 86 | 88 | |
| **Region** | | | | | | | | | |
| Metropolitan areas | 62 | 65 | 69 | 69 | 72 | 75 | 77 | 81 | |
| Ex-metropolitan areas | 52 | 54 | 61 | 63 | 65 | 68 | 71 | 74 | |
| Total households with access to a home computer | 58 | 61 | 66 | 67 | 70 | 73 | 75 | 78 | |
| **Total households in Australia** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | |

**Australian Bureau of Statistics**

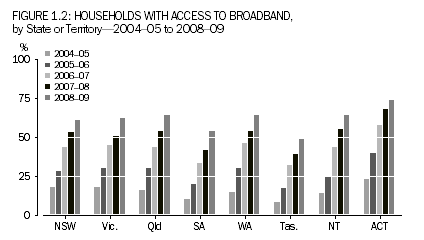
Refer to the table on the previous page to answer the following questions.

a) What is the trend of total households with access to a home computer? Justify your answer with some statistics.

b) What proportion of the total number of households with access to a home computer in Australia is made up by WA households in 2001 compared to 2008-09?

c) In 2004-05, which state or territory had the highest number of households with access to a home computer?

The following graph is also from the Household Use of Information Technology, study by the Australian Bureau of Statistics.



d) Which state or territory continually has the highest proportion of households with broadband internet connection and approximately what percentage does this state or territory represent in 2008-09?

**Question Two: [6 marks]**

Consider the following sets of data.

|  |  |
| --- | --- |
| **A** | Favourite Ice cream flavour |
| **B** | Heights of all Year 11s in WA |
| **C** | Hourly temperature for Sydney for one day |
| **D** | Average daily rainfall across ACT for the month of August |
| **E** | Finishing times in 100m race |
| **F** | Number of pets per household in VIC |

Consider the following graphs.

1. 2.

3. 4.

Next to the list of data sets **A** – **F** list the graph type/types (1 – 4) which would be appropriate for displaying each set of data.

**Question Three: [2, 3: 5 marks]**

a) A six sided dice is rolled 273 times and the following frequency histogram shows the results.

What can be concluded about the dice?

b) Twenty-six students in a class recorded their heights and the results were displayed in a histogram. Which of the following histograms is most likely to be displaying these results? Justify your solution with mathematical reasoning.

**Question Four: [1, 2, 2: 5 marks]**

Consider the following pie chart.

a) What proportion of those surveyed answered either soccer, netball or footy?

b) If 350 people answered swimming, how many people were surveyed?

c) What is the size of the angle representing the sector for swimming?

**Question Five: [4, 2 : 6 marks]**

A survey of 47 home renters revealed the following distribution of the weekly rental fees.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Rental Fee** | $100-199 | $200-299 | $300-399 | $400-499 | $500-599 | $600-$699 |
| **Frequency** | 6 | 11 | 14 | 8 | 5 | 3 |

a) Draw a frequency histogram on the grid below to represent the weekly rental fee data.



b) Determine the median class and modal class for this data.

**Question Six: [4, 2, 2: 8 marks]**

Consider the two sets of data displayed on the back-to-back stem and leaf plot below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data Set 1 | | | | | |  | Data Set 2 | | | | |  |
| 5 | 4 | 3 | 2 | 1 | 0 | 6 | 0 |  |  |  |  |  |
|  | 9 | 9 | 6 | 5 | 2 | 7 | 5 | 5 |  |  |  |  |
|  |  |  | 8 | 5 | 2 | 8 | 3 | 9 | 9 |  |  |  |
|  |  |  |  |  |  | 9 | 0 | 2 | 8 | 8 | 8 |  |
|  |  |  |  |  | 0 | 10 | 4 | 6 | 6 | 7 | 7 |  |
|  |  |  |  |  | 2 | 11 | 1 | 1 | 2 | 3 |  |  |
| 9 | 9 | 5 | 3 | 2 | 2 | 12 | 3 | 4 | 5 |  |  |  |
| 9 | 9 | 8 | 8 | 8 | 8 | 13 | 9 |  |  |  |  |  |

a) Calculate the range and the median for each set of data.

b) Without doing any further calculations comment on the spread of each data set.

c) Describe each distribution.

**Question Seven: [2, 3, 2: 7 marks]**

Consider the two box plots below and select whether the following statements are **true or false**.

****

a) In Data Set 2 there are no scores in the lower quartile.

b) The maximum score in Data Set 1 is an outlier.

c) Data Set 1 has the most number of scores in the upper quartile.

**Topic: Interpret graphs, tables, data and distributions SOLUTIONS**

Time: 45 mins Marks: /45 marks

**No calculator allowed**



**Question One: [2, 2, 1, 2: 7 marks]**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| **Region** | | | | | | | | | |
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| Total households with access to a home computer | 58 | 61 | 66 | 67 | 70 | 73 | 75 | 78 | |
| **Total households in Australia** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | |

**Australian Bureau of Statistics**

Refer to the table on the previous page to answer the following questions.

a) What is the trend of total households with access to a home computer? Justify your answer with some statistics.

 Increasing from 58% to 78%

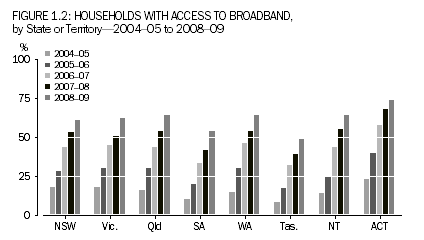
b) What proportion of the total number of households with access to a home computer in Australia is made up by WA households in 2001 compared to 2008-09?



c) In 2004-05, which state or territory had the highest number of households with access to a home computer?

NSW 

The following graph is also from the Household Use of Information Technology study by the Australian Bureau of Statistics.



d) Which state or territory continually has the highest proportion of households with broadband internet connection and approximately what percentage does this state or territory represent in 2008-09?

 ACT ~ 70%

**Question Two: [6 marks]**

Consider the following sets of data.

|  |  |
| --- | --- |
| **A** | Favourite Ice cream flavour 2, 3 |
| **B** | Heights of all Year 11s in WA 4 |
| **C** | Hourly temperature for Sydney for one day 1 |
| **D** | Average daily rainfall across ACT for the month of August 1 |
| **E** | Finishing times in 100m race 4 |
| **F** | Number of pets per household in VIC 2 |

Consider the following graphs.

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3. 4.

Next to the list of data sets **A** – **F** list the graph type/types (1 – 4) which would be appropriate for displaying each set of data.

**Question Three: [2, 3: 5 marks]**

a) A six sided dice is rolled 273 times and the following frequency histogram shows the results.

 Biased dice, 5 appears too often.

What can be concluded about the dice?

b) Twenty-six students in a class recorded their heights and the results were displayed in a histogram. Which of the following histograms is most likely to be displaying these results? Justify your solution with mathematical reasoning.

Adds to 26 Doesn’t add to 26 Unlikely



**Question Four: [2, 2, 2: 6 marks]**

Consider the following pie chart.

a) What proportion of those surveyed answered either soccer, netball or footy?



b) If 350 people answered swimming, how many people were surveyed?

 7000 people

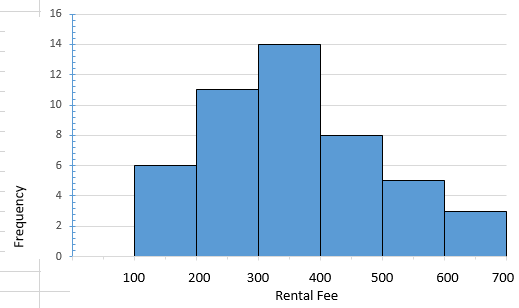
c) What is the size of the angle representing the sector for swimming?



**Question Five: [4, 2: 6 marks]**

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| **Rental Fee** | $100-199 | $200-299 | $300-399 | $400-499 | $500-599 | $600-$699 |
| **Frequency** | 6 | 11 | 14 | 8 | 5 | 3 |



a) Draw a frequency histogram on the grid below to represent the weekly rental fee data.

 Axes scale

 Midpoints

 No gaps

 Heights

b) Determine the median class and modal class for this data.

 Modal class = $300-$399

 Median class = $300-$399

**Question Six: [4, 2, 2: 8 marks]**

Consider the two sets of data displayed on the back-to-back stem and leaf plot below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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|  | 9 | 9 | 6 | 5 | 2 | 7 | 5 | 5 |  |  |  |  |
|  |  |  | 8 | 5 | 2 | 8 | 3 | 9 | 9 |  |  |  |
|  |  |  |  |  |  | 9 | 0 | 2 | 8 | 8 | 8 |  |
|  |  |  |  |  | 0 | 10 | 4 | 6 | 6 | 7 | 7 |  |
|  |  |  |  |  | 2 | 11 | 1 | 1 | 2 | 3 |  |  |
| 9 | 9 | 5 | 3 | 2 | 2 | 12 | 3 | 4 | 5 |  |  |  |
| 9 | 9 | 8 | 8 | 8 | 8 | 13 | 9 |  |  |  |  |  |

a) Calculate the range and the median for each set of data.



b) Without doing any further calculations comment on the spread of each data set.

Although the range is the same for each data set, Data Set 1 would have a larger standard deviation because the data is clustered further from the centre.

c) Describe each distribution.

 Both are symmetrical

**Question Seven: [2, 3, 2 : 7 marks]**

Consider the two box plots below and select whether the following statements are **true or false**.

****

a) In Data Set 2 there are no scores in the lower quartile.

 False

b) The maximum score in Data Set 1 is an outlier.



 True

c) Data Set 1 has the largest proportion of scores in the upper quartile.

 False