Multiple-choice section – choose the correct answer

Question 1 [8.1]

Which of the following surveys could be carried out by observation?

A The height, in cm, of each person in the train carriage

B The number of students in each class who are in full school uniform

C The number of second−hand cars in the car park at your school

D The level of support for a proposed change to the school uniform

Question 2 [8.2]

3, 1, 1, 2, 6, 4, 0, 7

The mean and median, respectively, of the set of eight data is:

A 4, 4 B 4, 2.5 C 3, 2.5 D 3, 4

Question 3 [8.3]

The class centre for a class interval of 25−29 is:

A 26.5 B 26.75 C 27 D 27.5

Question 4 [8.5]

The probability of choosing, by random selection, a red ball from a bag containing 3 red balls, 2 white balls and 4 brown balls is:

A  B  C  D 

Question 5 [8.5]

A die was rolled 30 times. The table shows the frequency of each number rolled.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Face | 1 | 2 | 3 | 4 | 5 | 6 |
| Frequency | 7 | 3 | 4 | 5 | 6 | 5 |

The relative frequency of a 4 was:

A  B  C  D 5

Question 6 [8.5]

A bowl contains 30 identical balls numbered 1 to 30. A ball is drawn at random from the bowl. The probability that the number on the ball is a multiple of 4 and a multiple of 6 is:

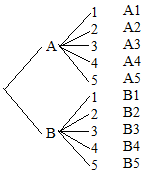
A  B  C  D 

Question 7 [8.7]

Sheldon has cereal for breakfast every day. Each day he randomly selects from the five different cereals on his shelf. The probability that Sheldon has *Korny Kobs*, one of the cereals on the shelf, two days in a row is:

A  B  C  D 

Question 8 [8.7]



For the tree diagram above the probability of B with an odd number is:

A  B  C  D 

Multiple-choice results: \_\_\_ / 8

Short answer section

Question 9 3 marks [8.1] [8.5]

categorical data certain chance continuous data discrete data

impossible random sample skewed symmetrical

Complete the following using words from the list above.

(a) An event for which the probability is 0 is said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

(b) The number of goals scored by each team in one round of a netball competition is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(c) If a statistical graph is not skewed it is said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Question 10 2 marks [8.5]

Write a list of at least 10 words and phrases associated with probability putting them in order from impossible to certain.

Question 11 5 marks [8.2]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | *x* | *f* | B | *x* | *f* | C | *x* | *f* |
|  | 30  31  32  33  34 | 15  16  6  3  1 |  | 15  16  17  18  19  20 | 2  2  0  5  9  6 |  | 48  49  50  51  52  53 | 4  6  15  15  6  4 |

(a) For which set of data above is mean = median?

(b) Which two sets of data have the same range?

(c) For the set of data with a positive skew, find the mean and median.

|  |  |  |
| --- | --- | --- |
| *x* | *f* | *x × f* |
|  |  |  |
|  |  |  |

Question 12 7 marks [8.3]

The following frequency table shows the distance thrown, in metres, by the students in the javelin competition at the Annual Athletics Carnival.

|  |  |
| --- | --- |
| Distance (m) | Frequency |
| 0−<10 | 3 |
| 10−<20 | 15 |
| 20−<30 | 20 |
| 30−<40 | 11 |
| 40−<50 | 2 |

(a) Calculate an estimate for the mean distance thrown by the competitors.

(b) Draw a histogram and use its shape to describe the data set.

Question 13 2 marks [8.5]

Nikki and Steven like playing tennis. Nikki has won 12 of the last 20 games played.

(a) Estimate the probability that the next game is won by Steven. Write your answer as a percentage.

(b) How many of the next eight games will Nikki expect to win?

Question 14 3 marks [8.5]

A box of coloured lollies contains 12 red, 5 orange, 1 pink and 3 brown.

(a) If a lolly is chosen at random find the probability it is neither red nor pink.

(b) If 5 lollies are chosen at random how many would you expect to be pink or brown?

Question 15 10 marks [8.6]

A bowl contains 20 small identical tiles each marked with a different number from 1 to 20. The following sets have been defined.

*A* = ‘even numbers’ *B* = ‘odd numbers’ *C* = ‘multiples of 4’ *D* = ‘2, 3, 5, 7, 11, 13, 17, 19’

(a) State whether or not each of the following pairs of sets are mutually exclusive.

(i) *A* and *B*

(ii) *A* and *C*

(iii) *A* and *D*

(b) If one tile is drawn at random, what is the probability that it will belong to group:

(i) *B* and *D*

(ii) *C* or *D*

(iii) *A* and *B*

(iv) *B* only?

Question 16 8 marks [8.7]

A bowl contains four red marbles, two yellow marbles and three blue marbles. Two marbles are drawn from the bowl without replacement.

(a) Write out the sample space making sure you distinguish between the marbles of the same colour.

Use the sample space to find the probability that:

(b) both marbles are red

(c) both marbles are the same colour

(d) neither marble is blue

(e) one marble is blue and the other is yellow.

Question 17 5 marks [8.3]

A particular data set has the following characteristics:

mode = 21

mean = 39

median = 27.5

(a) Describe this data set in terms of its skew.

(b) Write out a data set with 16 values that has these characteristics.

Short answer results: \_\_\_ / 42

Extended answer section

Question 18 15 marks [8.4]

The following lists are of heights, in cm, of 30 Year 9 students from each of NSW and Victoria recorded in a particular year.

NSW students:

174 164 150 159 177 164 163 156 158 177 143 170

160 162 179 152 157 158 165 168 177 167 155 174

165 187 184 161 170 180

Victoria students:

176 164 163 146 177 167 169 180 160 170 180 177

162 165 163 169 175 167 165 170 160 183 160 170

168 155 180 171 172 183

(a) Find the mean height for the students for each state, correct to 1 decimal place if necessary.

(b) Draw a back-to-back stem-and-leaf plot of the data. Use a class interval of 10.

(c) Find the median height and range of heights for the students for each State.

(d) What conclusions can you draw from the stem plot and the statistics calculated regarding the height of Year 9 students from NSW compared to those from Victoria?

(e) Estimate the mean, median and range of heights of Year 9 students for the whole of Victoria and NSW combined. Explain any assumptions you made and any limitations (e.g. time of the year) for your estimated values.

Question 19 8 marks [8.6]

The 26 students in your class were asked the following questions:

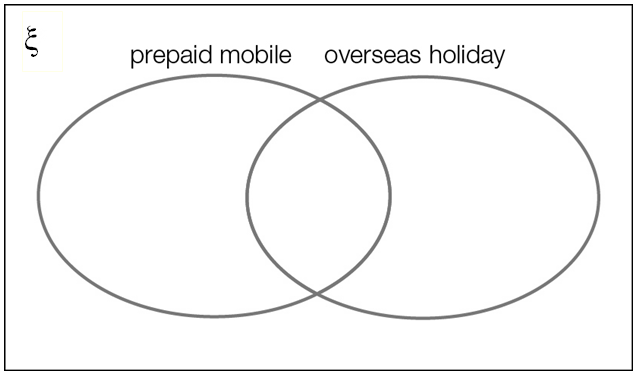
* Do you have a prepaid mobile phone?
* Have you been on an overseas holiday in the past year?

In summary: 18 had a prepaid mobile phone, 5 had been on an overseas holiday in the past year and 6 answered ‘No’ to both of these.

(a) Complete the two-way table for the 26 people.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Prepaid mobile | No Prepaid mobile |  |
| Overseas holiday |  |  |  |
| No overseas holiday |  |  |  |
|  |  |  | 26 |

(b) Complete the Venn diagram from the two-way table.



(c) If one of the members of your class was selected at random what is the probability that the person:

(i) has a prepaid mobile phone?

(ii) has a prepaid mobile phone and has been on an overseas holiday in the past year?

(iii) has not been on an overseas holiday in the past year?

(d) If you know the person chosen has been on an overseas holiday in the past year, what is the probability they have a prepaid mobile phone?

Question 20 14 marks [8.5]

Up until December 2015 Shaun Marsh had batted 30 times for Australia in Test Cricket. These are his scores:

141 81 18 44 0 0 3 0 11 3

0 148 44 0 0 32 17 32 99 73

1 19 13 11 69 0 2 2 49 182

(a) Find the mean, median and range of these scores. Round the mean correct to 1 decimal place.

(b) If one of Shaun’s innings was chosen at random find Pr(score is under 10). Write all probabilities as percentages to the nearest whole number.

(c) If the innings with scores under 10 were left out, what is the mean number of runs for the remaining innings?

(d) If one of Shaun’s innings was chosen at random find **(i)** Pr(at least 50) and **(ii)** Pr(at least 100).

(e) If Shaun was to reach 50 in a subsequent innings what are his chances of going on to make 100?

Extended answer results: \_\_\_ / 37

TOTAL test results: \_\_\_ / 87