Multiple-choice section – choose the correct answer

Question 1 [8.1]

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

A The age, in years, of each person in the train carriage

B The proportion of students in your class who were born interstate

C The number of Ford 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]

6, 4, 8, 3, 1, 2

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

A 4.8, 3.5 B 4, 5.5 C 4.8, 5.5 D 4, 3.5

Question 3 [8.3]

The class centre for a class interval of 20−29 is:

A 24.5 B 25 C 25.25 D 25.5

Question 4 [8.5]

The probability of choosing, by random selection, a brown 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 3 was:

A  B  C  D 4

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 is:

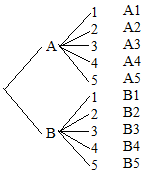
A  B  C  D 

Question 7 [8.7]

Sheldon has cereal for breakfast every day. Each day he randomly selects one of the three different cereals on his shelf. The probability that Sheldon has *Korny Kobs* 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 even number is:

A  B  C  D 

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

Short answer section

Question 9 3 marks [8.1, 8.4, 8.7]

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 1 is said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

(b) The number of brothers and sisters you have is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

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

Question 10 4 marks [8.6]

Write words and phrases associated with the following probabilities.

10%:

50%:

60%:

90%:

Question 11 4 marks [8.2]

Find the mean, median and range of the tabulated data set below.

|  |  |  |
| --- | --- | --- |
| *x* | *f* | *x* × *f* |
| 15  16  17  18  19  20 | 10  15  8  3  1  2 |  |
|  |  |  |

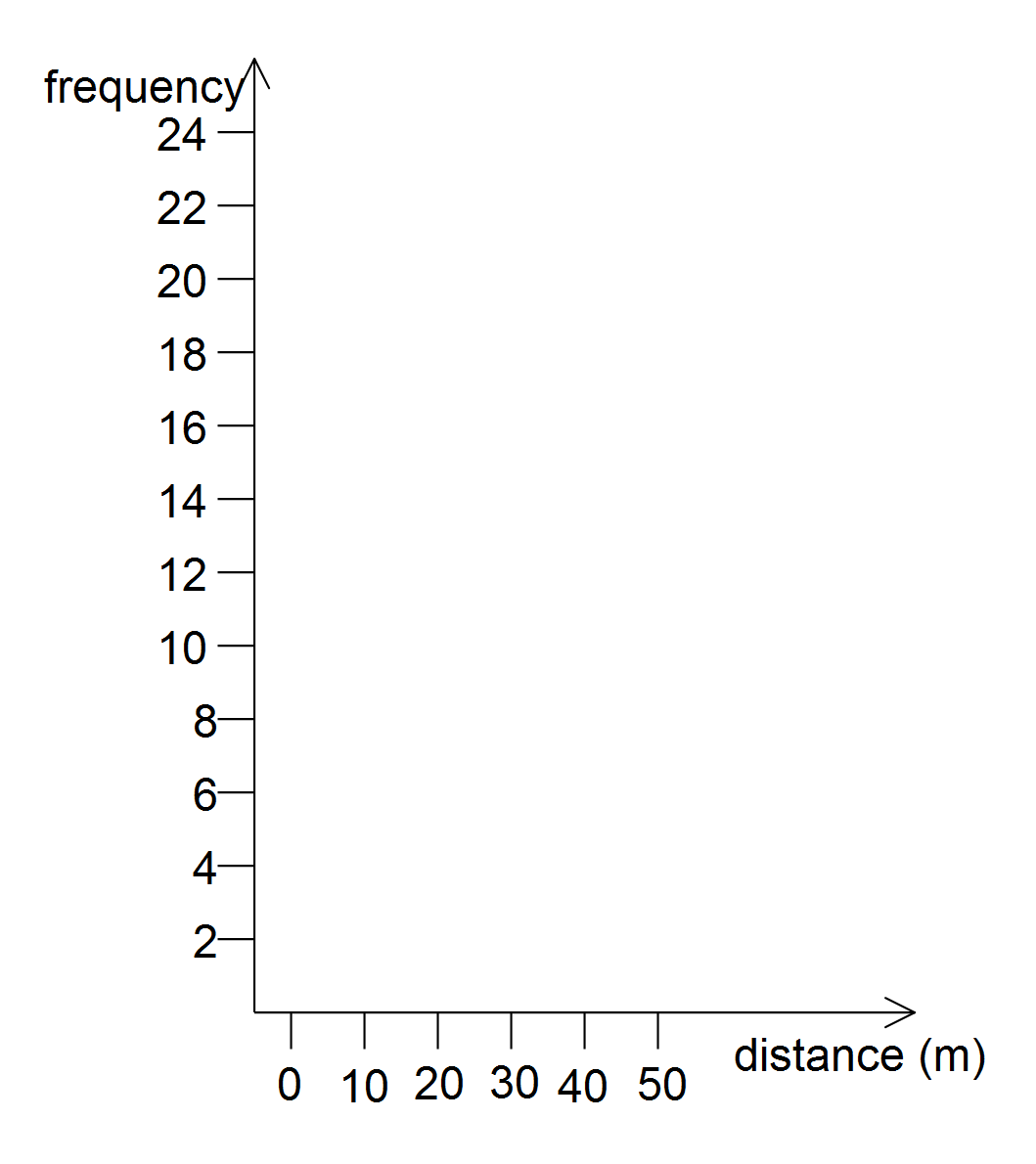
Question 12 6 marks [8.3]

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 (*f*) | Midpoint (*x*) | *xf* |
| 0−<10 | 4 |  |  |
| 10−<20 | 12 |  |  |
| 20−<30 | 24 |  |  |
| 30−<40 | 9 |  |  |
| 40−<50 | 1 |  |  |
|  | Σ*f* = |  | Σ*xf* = |

(a) Calculate an estimate for the mean distance thrown by the competitors. (Fill in the blank columns above to help you find this estimate.)

(b) Construct a histogram on the axes below.



(c) Looking at your histogram, would you say that the data is symmetrical, positively skewed or negatively skewed?

Question 13 2 marks [8.5]

Rhonda and Michelle like playing chess online. Michelle has won 15 of the last 25 games played.

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

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

Question 14 3 marks [8.5]

A box of coloured lollies contains 10 red, 12 orange, 6 pink and 4 brown lollies.

(a) If a lolly is chosen at random, what is the probability that it is neither red nor pink?

(b) If 8 lollies are chosen at random how many would you expect to be pink or brown?

Question 15 7 marks [8.6]

A bowl contains 26 small identical tiles each marked with a different letter of the alphabet. The following sets have been defined.

*A* = ‘vowels’ *B* = ‘consonants’ *C* = ‘a, b, c, d, e, f’ *D* = ‘q, w, e, r, t, y, u, i, o, p’

(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:

(i) *B* and *C*

(ii) *C* or *D*

(iii) *A* and *B*

(iv) *B* only?

Question 16 8 marks [8.7]

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

(a) Complete the array to show the sample space.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | R1 | R2 | Y1 | Y2 | B1 | B2 |
| R1 |  |  |  |  |  |  |
| R2 |  |  |  |  |  |  |
| Y1 |  |  |  |  |  |  |
| Y2 |  |  |  |  |  |  |
| B1 |  |  |  |  |  |  |
| B2 |  |  |  |  |  |  |

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.

Short answer results: \_\_\_ / 37

Extended answer section

Question 17 14 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:

164 160 167 164 176 156 188 164 166 174 179 167

142 148 175 126 155 150 173 179 146 182 152 160

170 172 162 174 182 152

Victoria students:

167 164 166 186 167 165 182 161 177 157 161 162

165 165 172 166 167 178 160 160 167 174 175 164

167 175 159 168 162 174

(a) Find the mean height of the students for each of NSW and Victoria. Round your answers correct to 1 decimal place.

(b) Complete the back-to-back stem plot of the data.

|  |  |  |
| --- | --- | --- |
| NSW Year 9 students |  | Victoria Year 9 students |
|  | 12 |  |
|  | 13 |  |
|  | 14 |  |
|  | 15 |  |
|  | 16 |  |
|  | 17 |  |
|  | 18 |  |

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

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

Question 18 8 marks [8.6]

The 22 students in your class were asked the following questions:

— Do you have a TV in your bedroom?

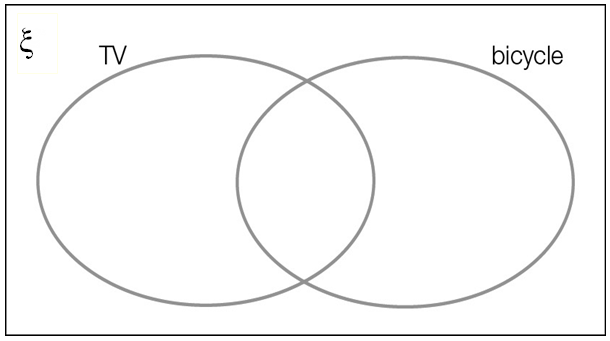
— Do you ride a bicycle regularly?

In summary, 7 had a TV in their room, 10 rode a bicycle regularly and 7 did neither of these.

(a) Complete the two-way table for the 22 people.

|  |  |  |  |
| --- | --- | --- | --- |
|  | TV in bedroom | No TV |  |
| Ride bicycle |  |  |  |
| No riding |  |  |  |
|  |  |  | 22 |

(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 TV in their bedroom?

(ii) has a TV in their bedroom and regularly rides a bicycle?

(iii) does not regularly ride a bicycle?

(d) If you know the person chosen regularly rides a bicycle, what is the probability they have a TV in their bedroom?

Question 19 10 marks [8.5]

Up until December 2015 Usman Khawaja had batted 22 times for Australia in Test Cricket. These are his scores:

37 21 21 26 13 12 65 38 0 7 23

14 54 1 24 0 21 174 9 121 144 56

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

(b) If one of Usman’s test innings was chosen at random find the following probabilities as percentages to the nearest whole number:

(i) Pr(score from 0 to 9)

(ii) Pr(score of at least 50)

(iii) Pr(score of at least 100)

Extended answer results: \_\_\_ / 32

TOTAL test results: \_\_\_ / 77