Total = $\overline{30}$

Unit 3 Further Christmas Holiday Homework

Name:

Multiple Choice (12 marks)

The following information relates to Questions 1 and 2

A number of households were asked about having a water tank on their premises. Their responses are summarised in the table below.

Water Tank	Number of households
Have one on order	73
Have one already installed	61
Do not have one and do not have one on order	146

Question 1

The percentage of households interviewed who already have a water tank installed is closest to

A.   22%
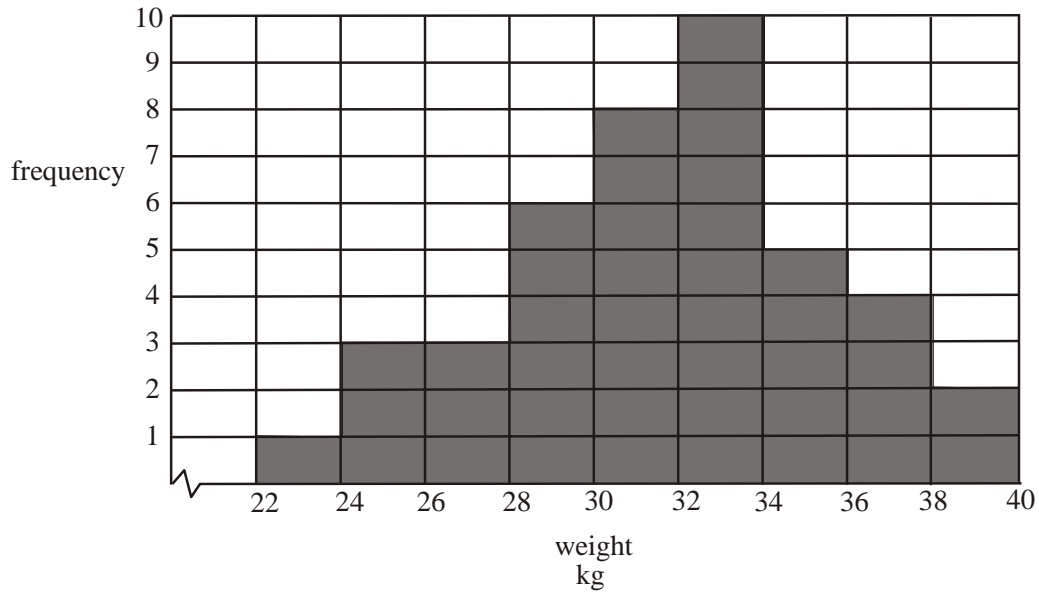
B.   26%

C.   42%

D.   50%

E.   52%

Question 2

Which **one** of the following graphs would be best to display the data given in the table?

A.   A scatterplot

B.   A stem-and-leaf plot

C.   A box plot

D.   A bar chart

E.   A histogram

The weight in kg of 42 Year 3 students is shown on the histogram below.

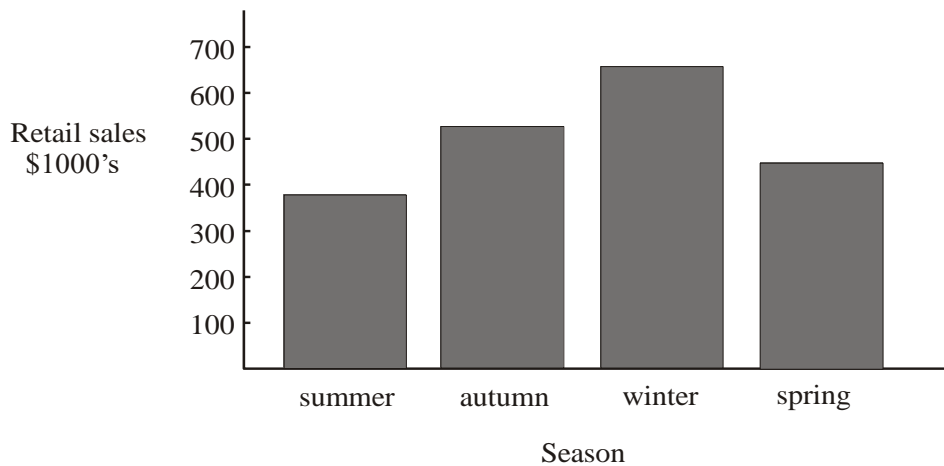## Question 3

The number of students who weigh more than 32kg is

A.   11

B.   20

C.   21

D.   23

E.   29

Question 4
The percentage of students who weigh between 26 and 30kg is closest to

A.   7%

B.   10%

C.   14%

D.   21%

E.   43%

Question 5

The retail sales of an outdoor adventure shop over a year are shown on the bar chart above.

The two variables displayed can be described as

A. both categorical

B. both numerical

C. one numerical but the other not categorical

D. neither categorical nor numerical

E. one categorical and one numerical

The following information relates to Questions 6 and 7

The stem-and-leaf plot below shows the ages of people applying for a passport in Victoria on a particular day.

	Age
1	7 8 9 9 9
2	0 1 2 2 4 7
3	0 1 2 3 5 6
4	2 5 8
5	4 7
6	2 3 5 7 8 9 9
7	1

Question 6

The percentage of people under 25 applying for a passport on this day was closest to
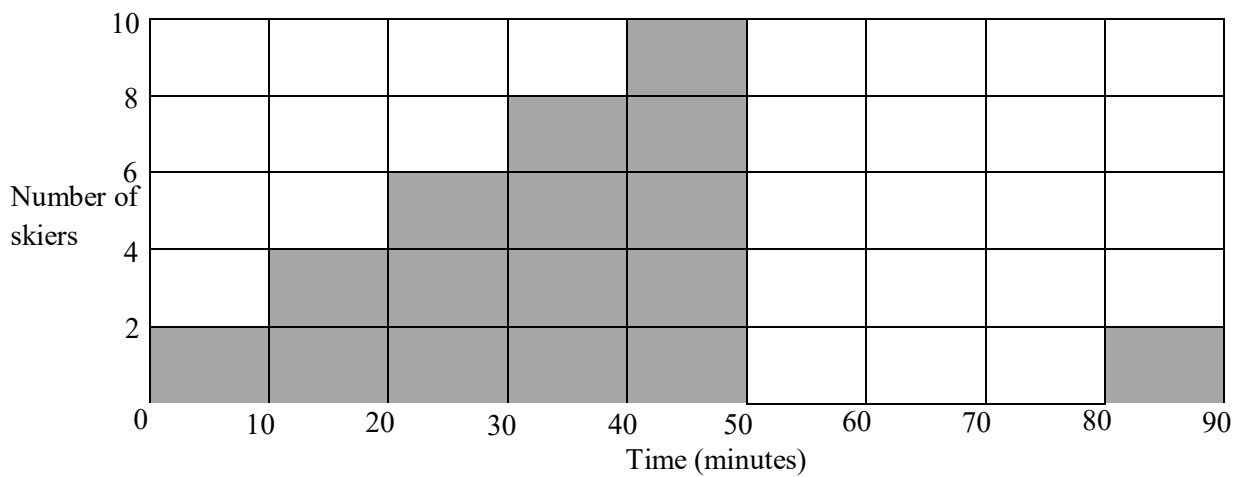
A.   10%

B.   22%

C.   33%

D.   40%

E.   52%

Question 7

The interquartile range for the given data is

A.   34

B.   35

C.   40

D.   41

E.   42

The following information relates to Questions 8 and 9

The graph above shows the time taken in minutes for various people to ski down a slope.

Question 8
The best description of the above histogram is

A.   positively skewed with an outlier

B.   negatively skewed with an outlier

C.   approximately symmetric with an outlier

D.   positively skewed with no outlier
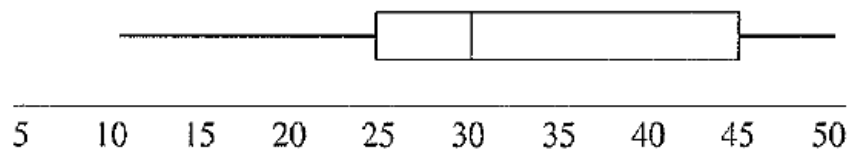
E.   negatively skewed with no outlier

Question 9
The number of people who take more than 30 minutes to ski down the slope is

A.   10

B.   12

C.   18

D.   20

E.   50

Question 10

Which of the following statements accurately describes the data shown?


```
           |‾‾‾‾‾‾‾|‾‾‾‾‾‾‾‾‾‾‾‾‾‾|
-----------|       |              |---------
   5   10  15  20  25  30  35  40  45  50
```

A.   The IQR and range are 30 and 40 respectively.
B.   The mean is 30.
C.   The median is 25.
D.   30 percent of the data is less than 25.
E.   The IQR and range are 20 and 40 respectively.

Question 11

The length of steel rods produced by a machine are approximately normally distributed with a mean of 20.5cm and a standard deviation of 0.7cm. The percentage of steel rods that are less than 21.9cm long is

A.   95%

B.   95.13%

C.   97%

D.   97.5%

E.   99.7%

Question 12

Results in a Year 11 English exam were normally distributed with a mean of 65 and a standard deviation of 11.

John's result was 71. His standardized result or z-score is closest to

A. -0.92

B. -0.55

C.   0.01

D.   0.55

E.   0.92

Short Answer (18 marks)

Question 1

Levi	Hippo
90	45
100	80
130	75
85	90
74	130
62	135
95	128
140	126
120	114
18	116
12	130
100	100
85	110

The above table shows the hours spent flying in the last month by thirteen stewards from each of two companies, Levi and Hippo.

a. What percentage of Levi stewards flew for at least 85 hours? Give your answer to one decimal place.

1 mark

b. What was the standard deviation for the number of flying hours for the Hippo stewards? Give your answer to 3 significant figures.

1 mark

c. If the standard deviation for the number of flying hours for the Levi stewards was 38.0 hours, write a sentence describing the difference between the flying hours of the stewards on the two airlines.
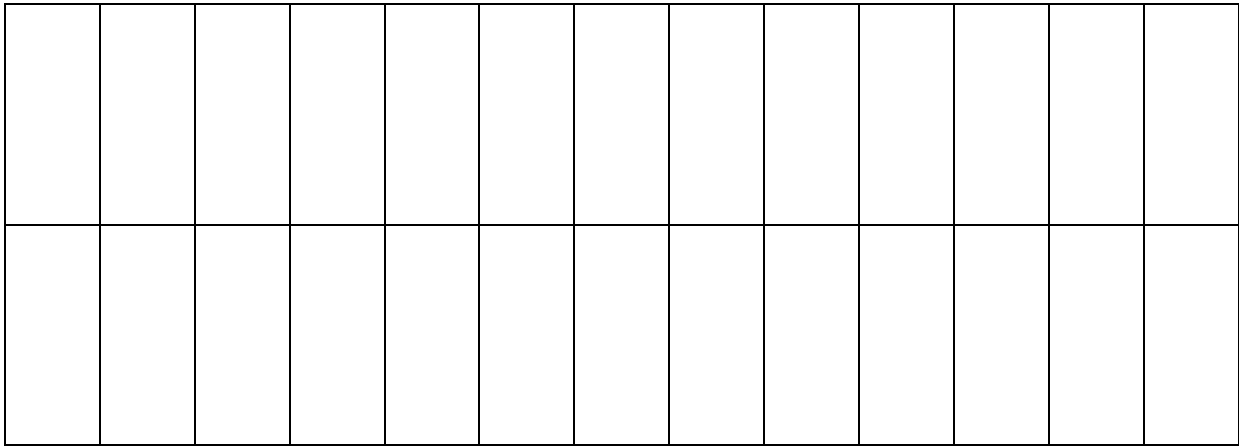
1 mark

d. Are any of the Hippo flying hours outliers? Justify you answer with an appropriate mathematical calculation.

2 marks

e. In the space below, draw box plots for the number of hours flown by the Hippo stewards and the number of hours flown by the Levi stewards

4 marks

Number of Hours Flying Time

f. Compare the two box plots with respect to skewness.

1 mark

Question 2

A sample of year 9 and 10 students was tested for mathematical ability, artistic ability and language ability, and the results listed in the table below.

Year 9			Year 10		
Maths	Art	Language	Maths	Art	Language
6	4	8	7	10	5
3	9	5	9	9	9
9	6	5	10	9	7
5	8	7	4	9	7
3	6	6	6	4	3
5	6	6	10	7	10
7	4	9	8	5	4
5	7	10	7	6	6
6	5	6	8	6	7
4	6	5	5	7	8

a.   Find the mean and standard deviation for artistic ability for year 9 students.
Give your answers to 2 significant figures.

Mean =

Standard Deviation =

2 marks

b.   **(i)** If all year 9 students in Australia were tested for artistic ability and the distribution was found to be normally distributed with a mean of 4 and a standard deviation of 1, what can be said about a student who gets a score of 6 for artistic ability? *A reference to % must be in your response*

2 marks

(ii) Were any of the students from the Year 9 sample in the lowest 2.5% of the Australian population of year 9 students for artistic ability?
Give a reason for your answer.

1 mark

Year 9

Year 10

| | | | | | | | | | |
|0|1|2|3|4|5|6|7|8|9|10|

Mathematical Ability
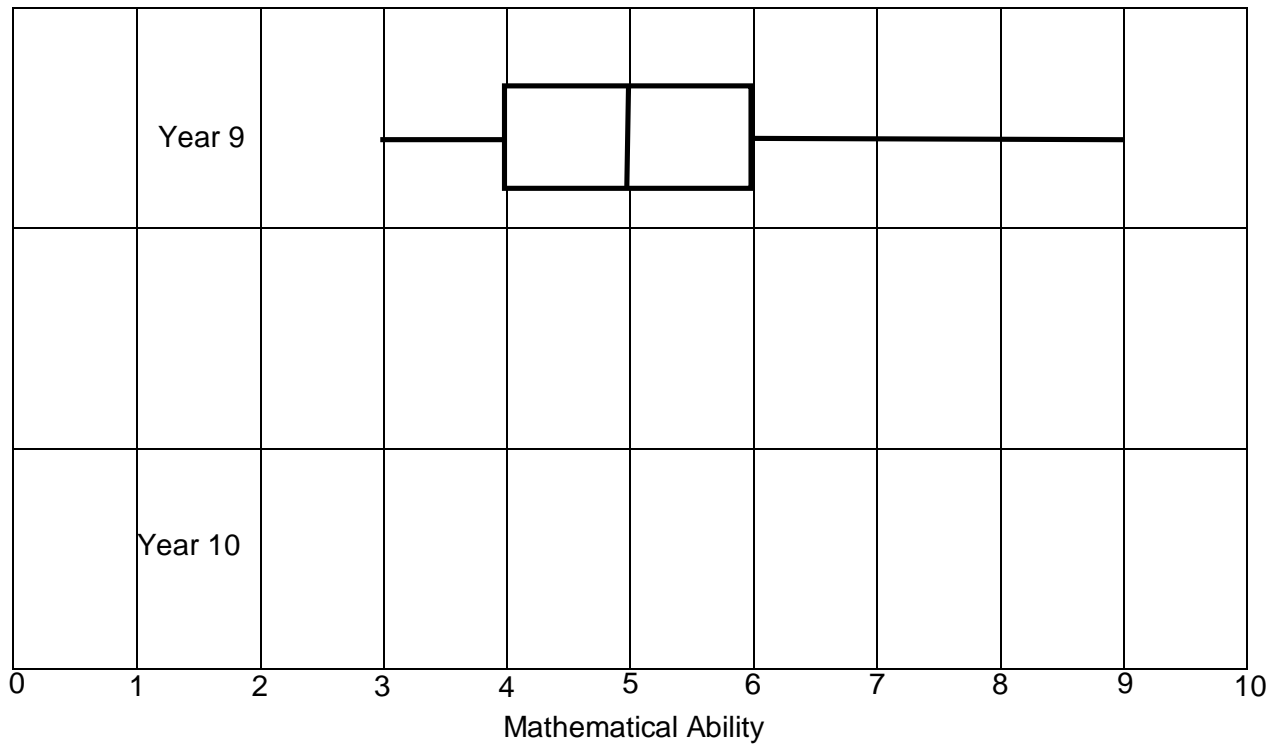
c.   **(i)** On the graph above, draw a box plot for the mathematical ability of the year 10 sample.

2 marks

(ii) Use the above graphs to compare the mathematical ability of year 9 and year 10 students, supporting your argument with a relevant statistic.

1 mark