education equals

Topic: Interpret graphs, tables, data and distributions

Time: 45 mins Marks: /45 marks

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.

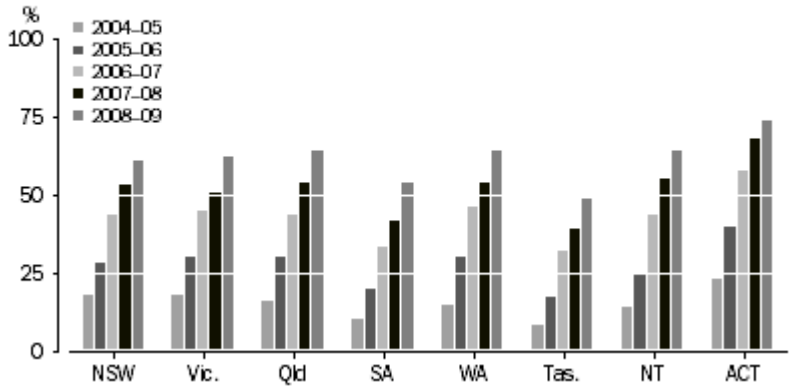
a) What is the trend of total households with access to a home computer? Justify your answer with some statistics.

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.

FIGURE 1.2: HOUSEHOLDS WITH ACCESS TO BROADBAND, by State or Territory—2004–05 to 2008–09



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?

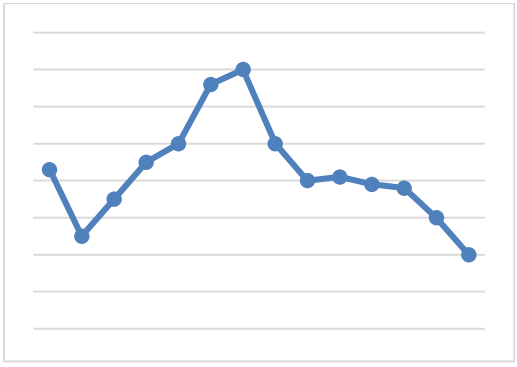
Question Two: [6 marks]

Consider the following sets of data.

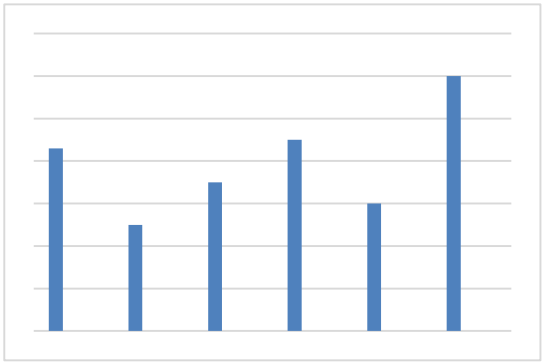
A	Favourite Ice cream flavour
B	Heights of all Year 11s in WA
C	Hourly temperature for Sydney for one day
D	Average daily rainfall across ACT for the month of August
E	Finishing times in 100m race
F	Number of pets per household in VIC

Consider the following graphs.

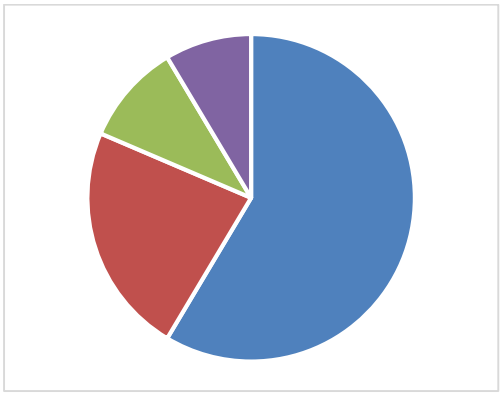
1.



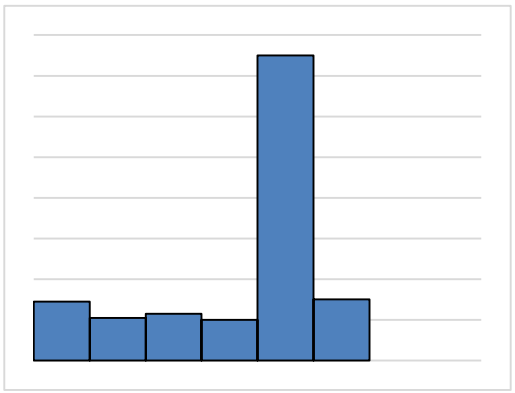
2.



3.



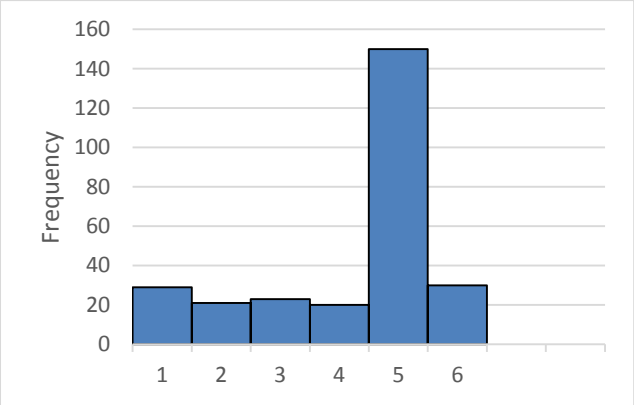
4.



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.

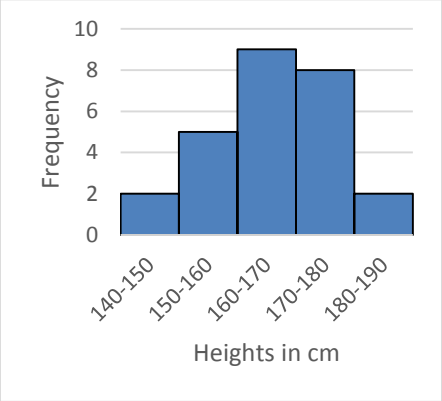
Question Three: [2, 3: 5 marks]

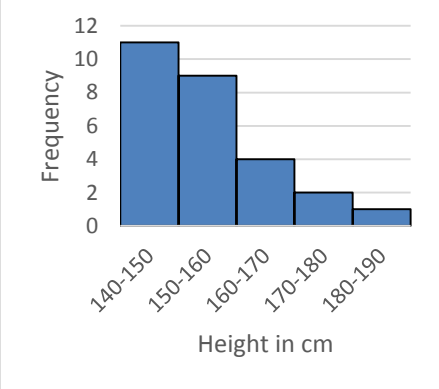
a) A six sided dice is rolled 273 times and the following frequency histogram shows the results.

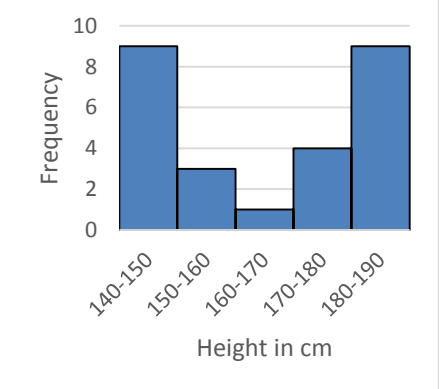


What can be concluded about the dice?

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.

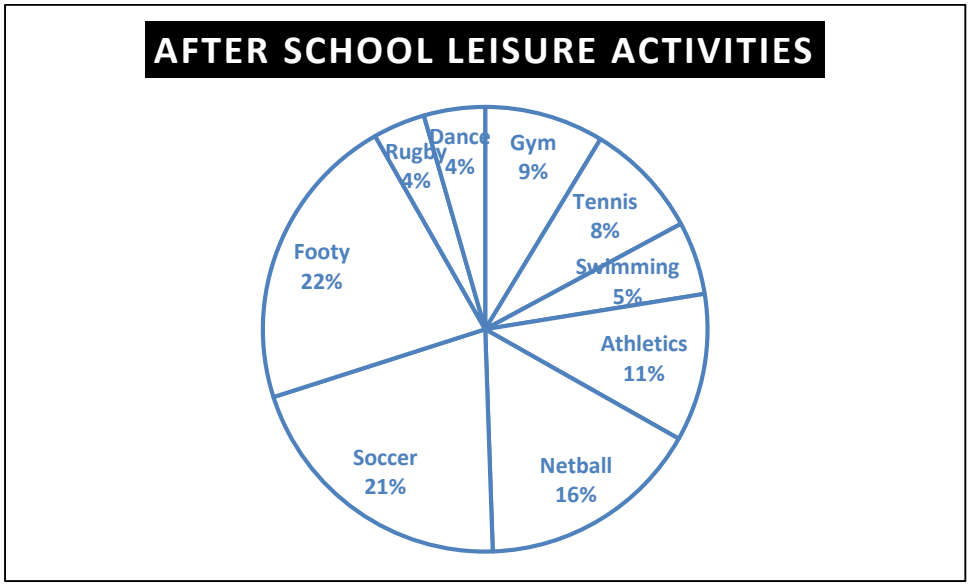






Question Four: [1, 2, 2: 5 marks]

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?

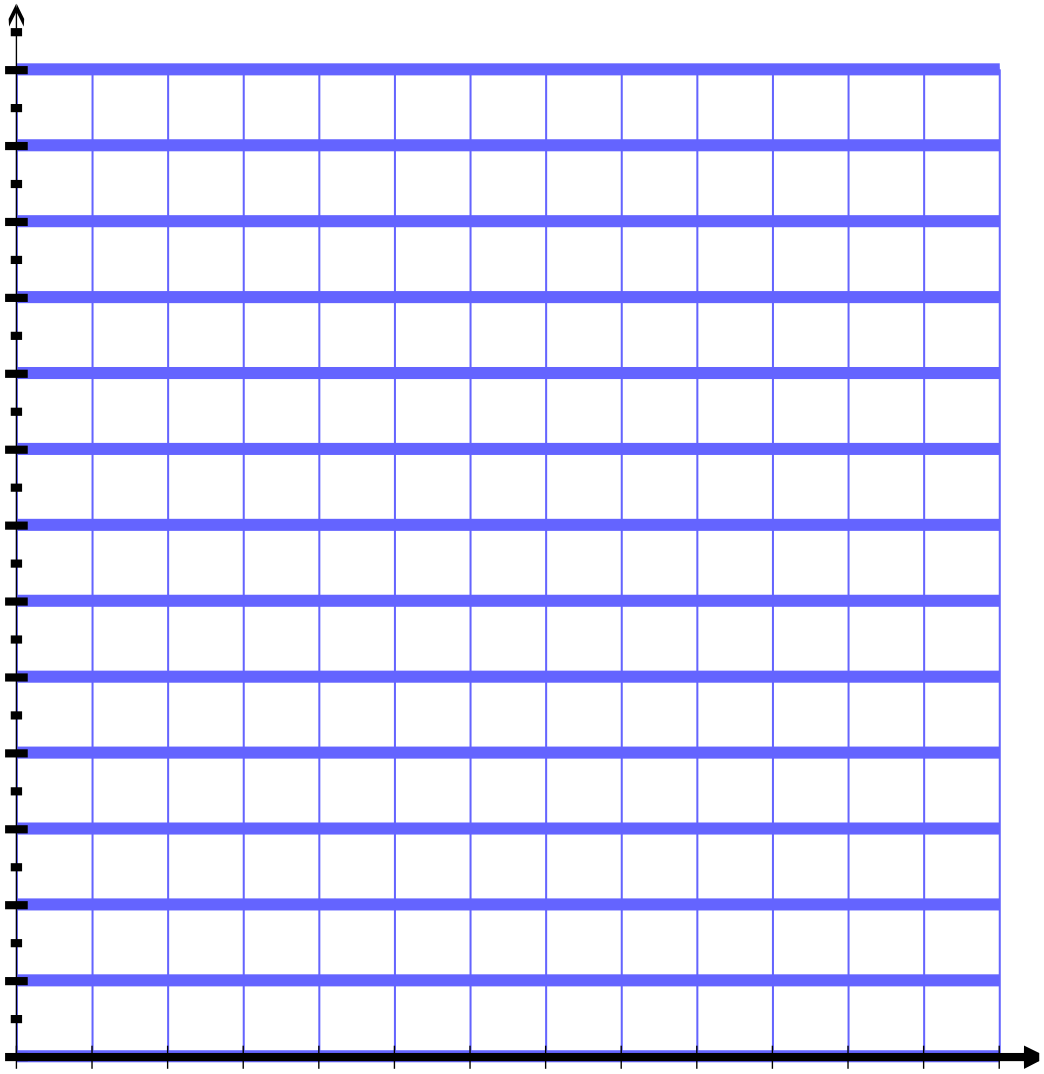
c) What is the size of the angle representing the sector for swimming?

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				
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			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				

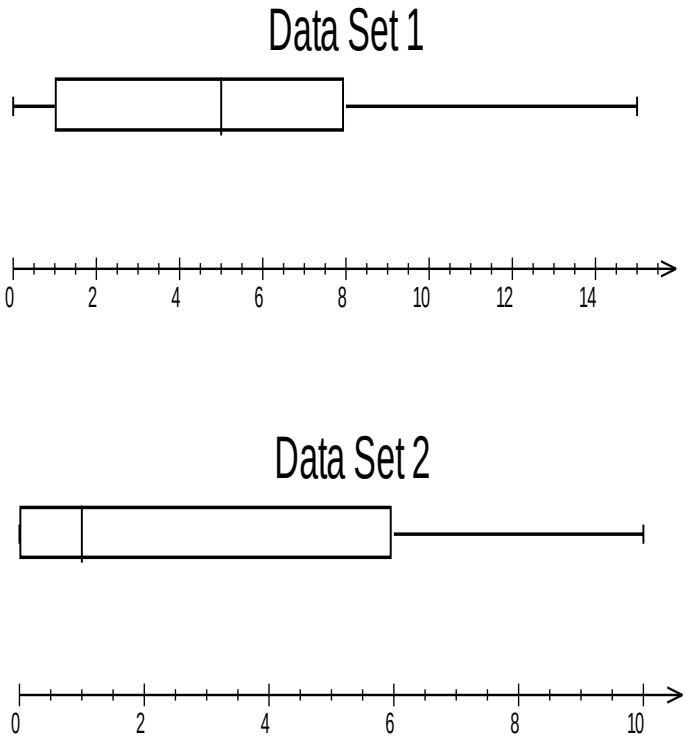
a) Calculate the range and the median for each set of data.

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.

education equals

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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?

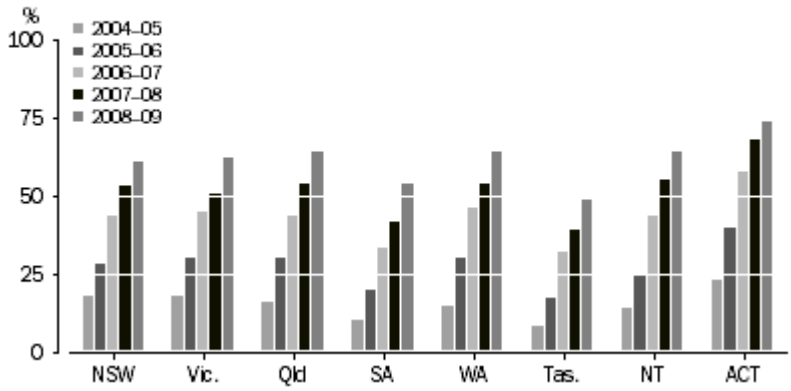
$\frac{427}{7377} = 0.058$ $\frac{673}{8189} = 0.082$

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.

FIGURE 1.2: HOUSEHOLDS WITH ACCESS TO BROADBAND, by State or Territory—2004-05 to 2008-09



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%

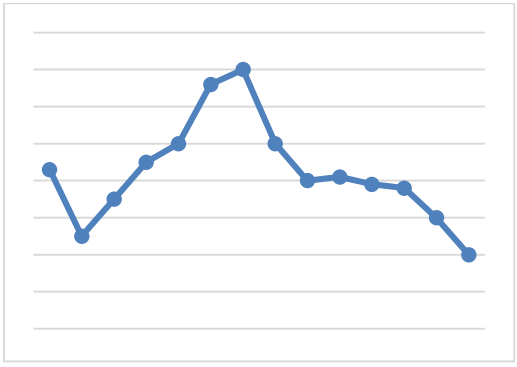
Question Two: [6 marks]

Consider the following sets of data.

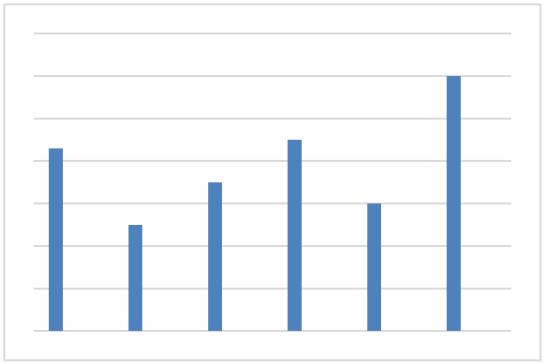
A	Favourite Ice cream flavour	2, 3 ✓
B	Heights of all Year 11s in WA	4 ✓
C	Hourly temperature for Sydney for one day	1 ✓
D	Average daily rainfall across ACT for the month of August	1 ✓
E	Finishing times in 100m race	4 ✓
F	Number of pets per household in VIC	2 ✓

Consider the following graphs.

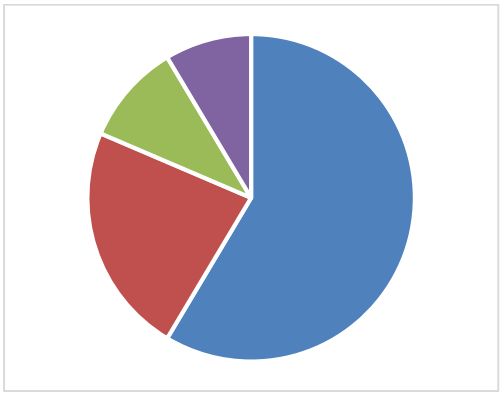
1.



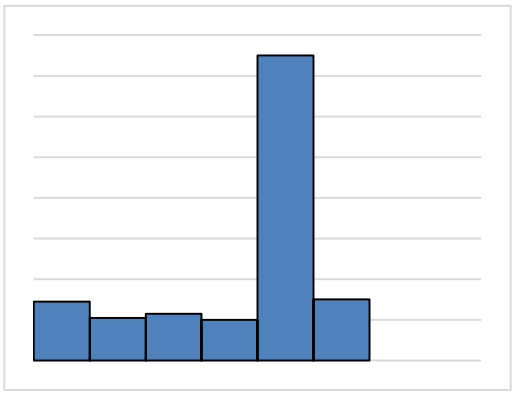
2.



3.



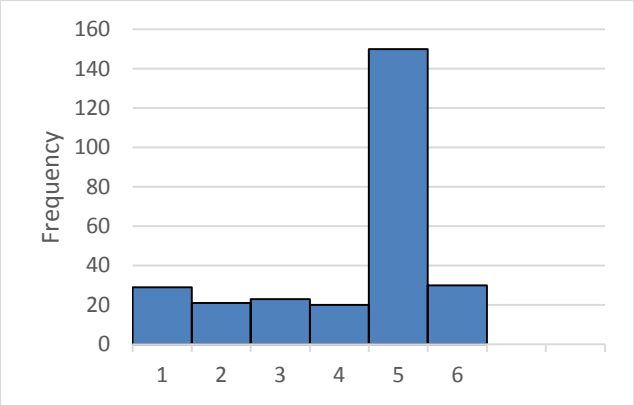
4.



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]

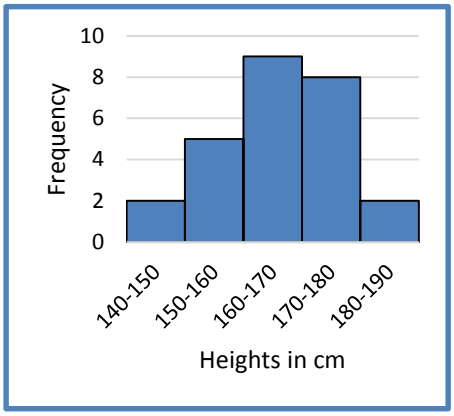
a) A six sided dice is rolled 273 times and the following frequency histogram shows the results.

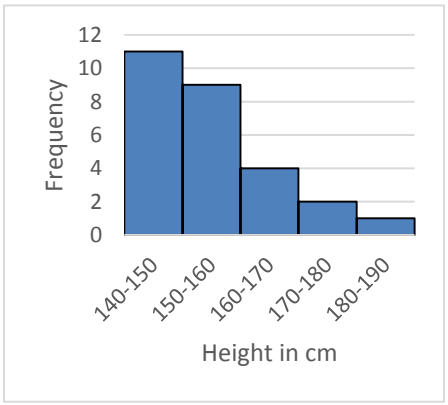


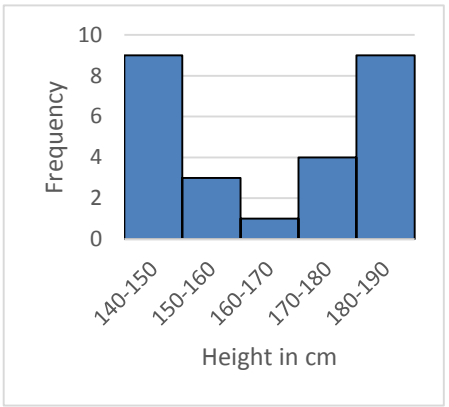
✓ ✓
Biased dice, 5 appears too often.

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.







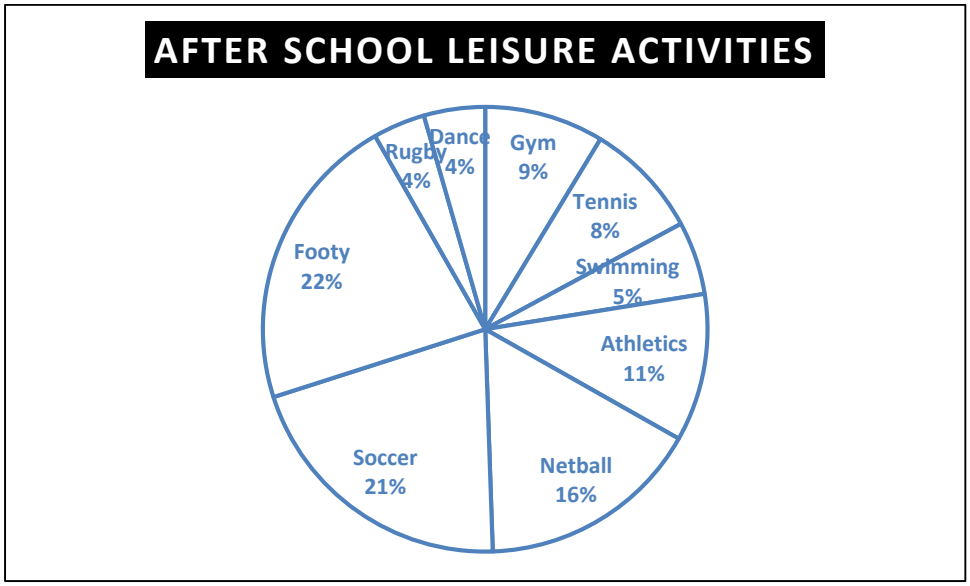
Adds to 26 ✓

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?

$22 + 21 + 16 = 59\%$ ✓ ✓

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

$\frac{350}{x} = 5\%$ ✓ 7000 people ✓

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

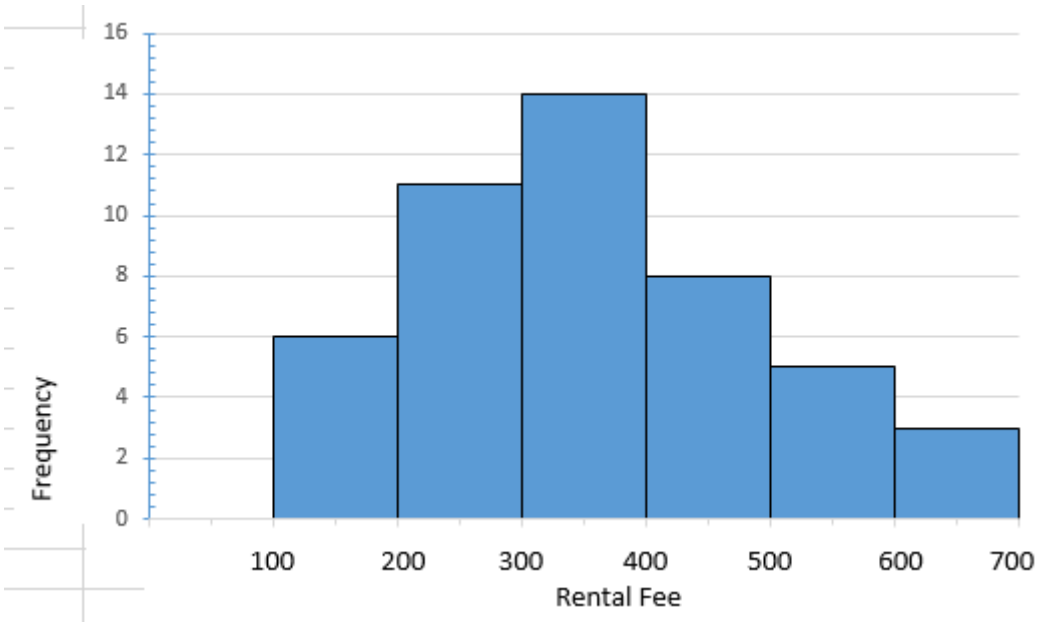
$0.05 \times 360 = 18°$ ✓ ✓

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.



✓ 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.

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.

Data Set 1: $139 - 60 = 79$ ✓

Data Set 1: 94 ✓

Data Set 2: $139 - 60 = 79$ ✓

Data Set 2: 105 ✓

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

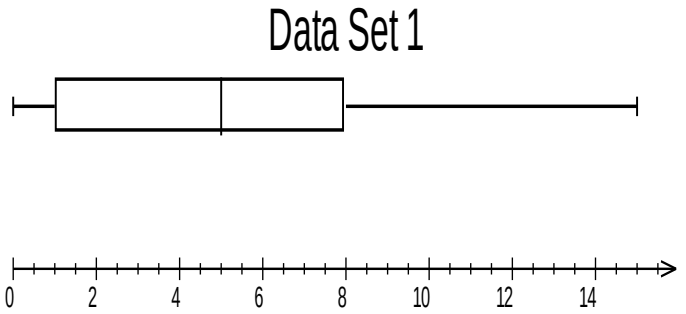
Although the range is the same for each data set, Data Set 1 would have a larger standard deviation because the data is clustered further from the centre. ✓

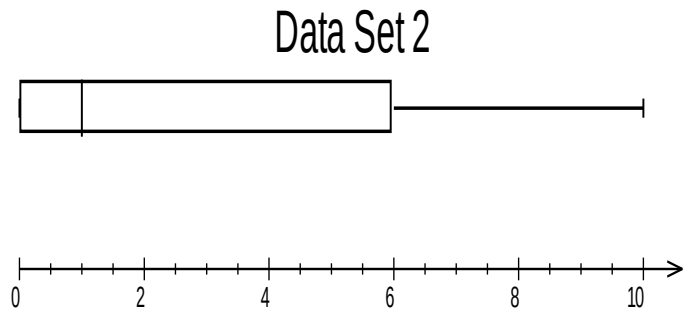
c) Describe each distribution.

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.

$5 + 6 \times 1.5$ ✓

$= 9 + 9 = 14$ ✓

True ✓

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

False ✓✓