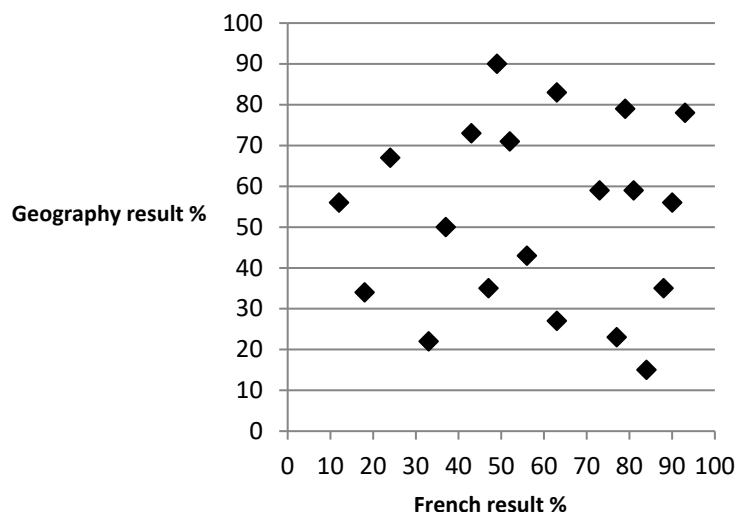
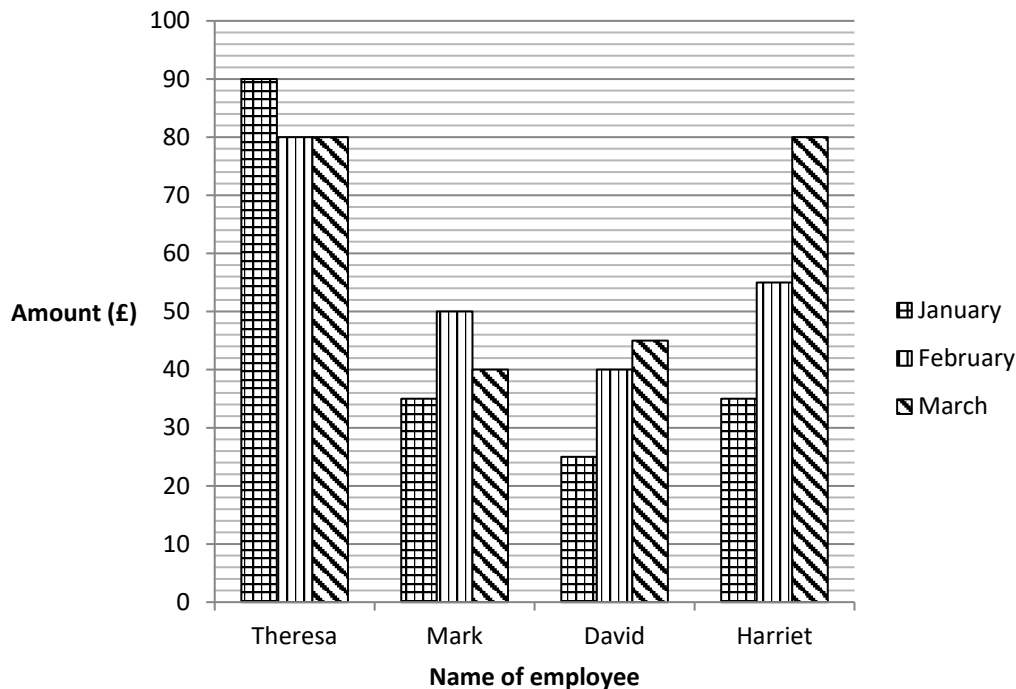


OCR 12 Statistics (Foundation)

1. Describe the correlation in the scatter diagram.



2. The multiple bar chart below represents the amount of expenses claimed by four employees in three months.

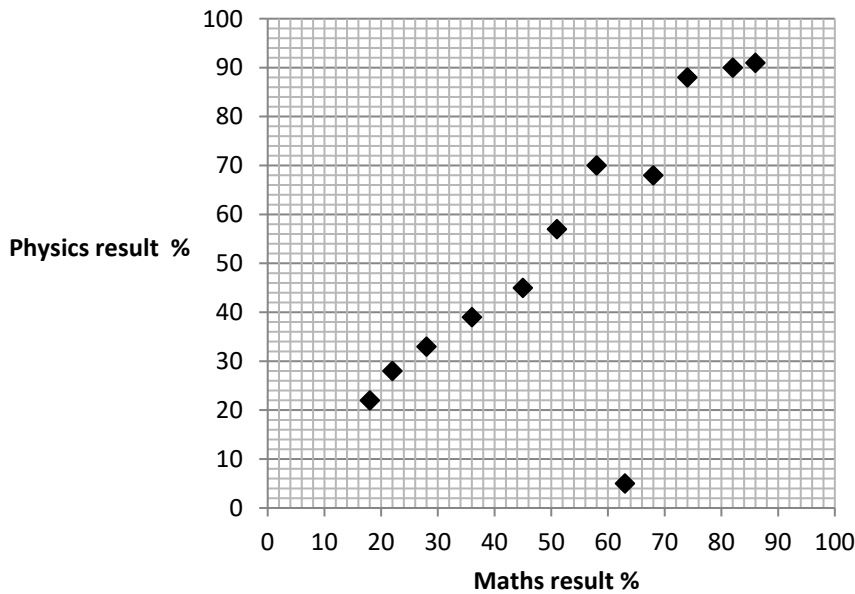


How much did David claim in expenses in February?

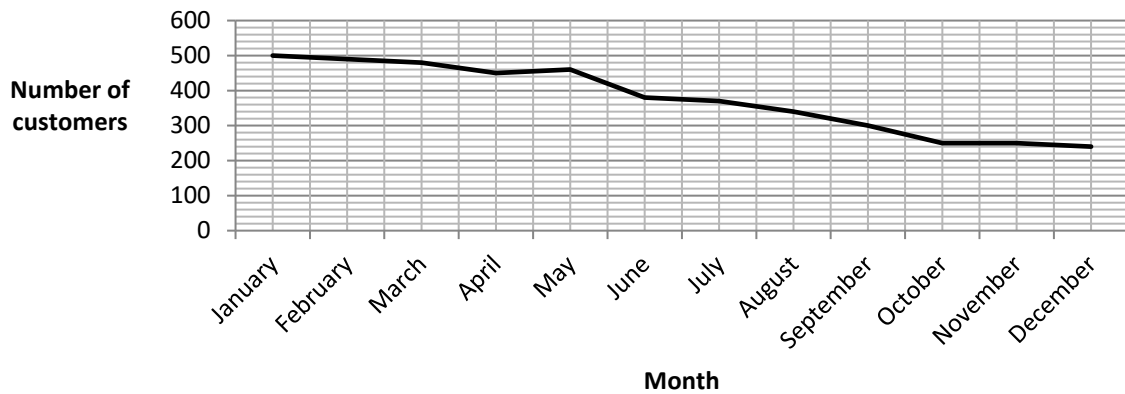
MATHEMATICS

Section Check In

3. The diagram below shows the maths and physics results of 12 students. Circle any point on the diagram that may be considered an outlier.



4. The mean of a sample is always equal to the mean of the population. Is this statement true or false?
5. The time series graph below shows the number of customers at Viv's Hairdressers over a 12 month period. Describe the trend in the number of customers over this period.



6. Here are the ages of 30 employees.

22 46 58 44 32 64 47 61 53 21 41 33 48 30 27
 35 41 33 24 39 53 22 52 63 20 49 46 49 31 47

Complete the following table and identify the modal class.

Age	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Number of employees									

7. Ian and Alan are car salesmen. Here is a table showing their sales figures for the last four months.

Month	Number of cars sold	
	Ian	Alan
1	8	20
2	12	16
3	12	16
4	16	4

Calculate the range and mean for the two salesmen and use these values to comment on their sales performance.

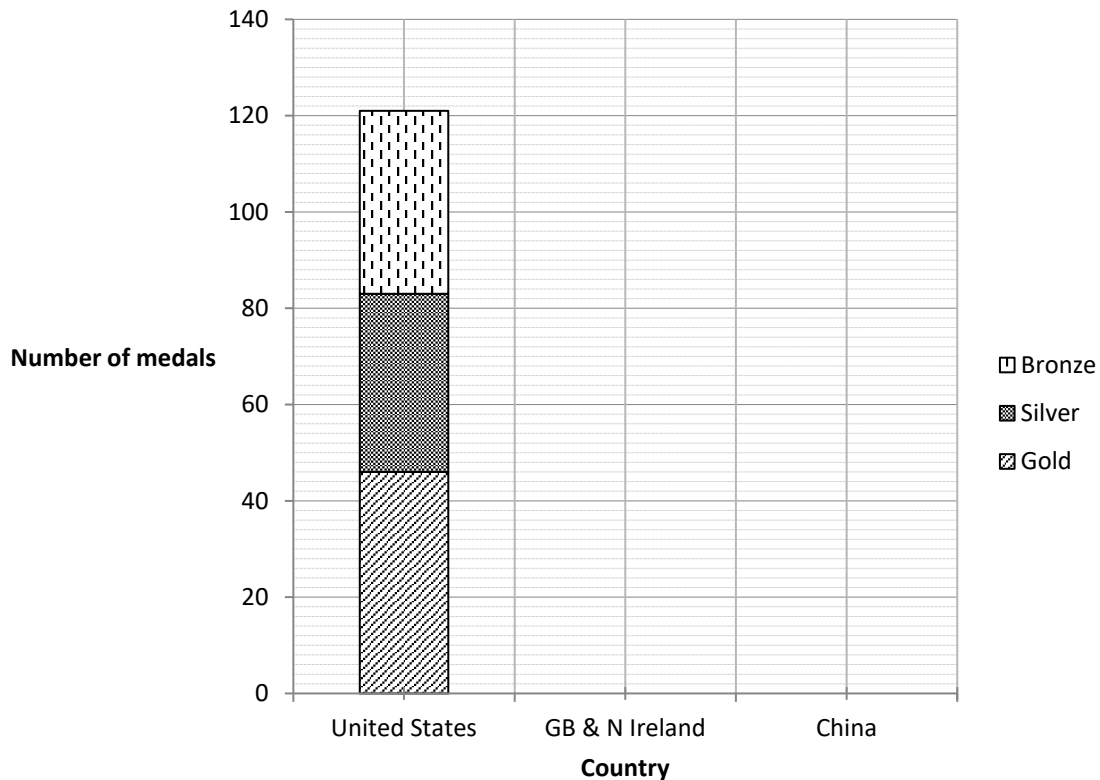
8. The data below is a record of the weekly amount of rainfall in a particular town over a six week period. Draw a time series graph to show this information.

Time	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Amount of rainfall (mm)	6	10	17	15	8	14

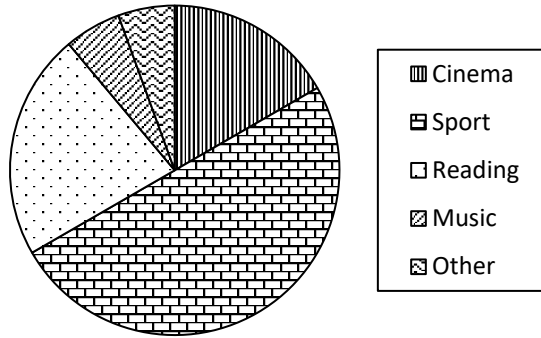
9. Below is a medal table for some countries in the 2016 Olympic Games.

	Gold	Silver	Bronze
United States	46	37	38
GB & N Ireland	27	23	17
China	26	18	26

Complete the composite bar chart to display the data above.



- The mean weight of six particular adults is 70 kg. The individual weights of five of them are 61 kg, 72 kg, 78 kg, 59 kg and 85 kg. Find the weight of the sixth adult.
- Lester defines simple random sampling as a sample where some members of the overall population are less likely to be included than others. Is he correct? Explain your answer.
- The pie chart below represents the responses from 180 students asked their favourite hobby. Matilda states that 50 students said reading. Is she correct? Explain your answer.



- The table below shows the results of 40 students in a chemistry test.

Mark	Frequency
2	11
5	2
6	12
8	7
10	8

Dylan says that one quarter of the students scored less than the mean mark. Is he correct? Show your working.

- Describe what is wrong with the pictogram below.

Number of houses built over a three year period

Year	Number of houses built
2014	
2015	
2016	

MATHEMATICS

Section Check In

15. The resting heart rate in beats per minute (bpm) of seven adults is shown below.

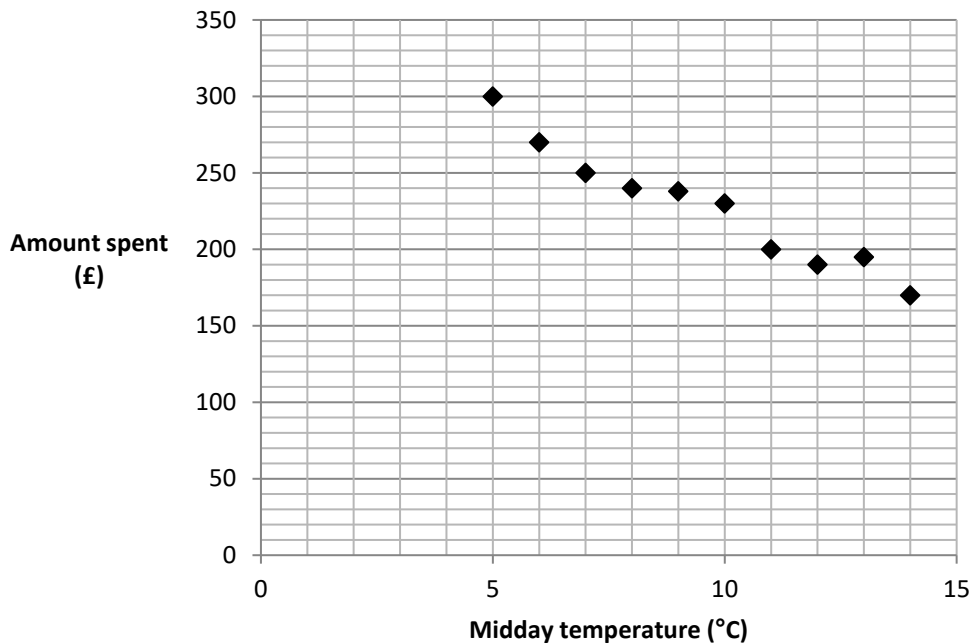
65 89 74 95 88 52 83

Lily is asked to calculate the range and median of this data. She calculates the range as 43 bpm and the median as 78 bpm. Explain what Lily has done wrong.

16. A union votes on strike action. 100 people vote and the ratio of Yes : No : Undecided is 9 : 8 : 3. Complete the table below and use it to construct a pie chart.

Vote	Number of people	Size of angle
Yes		
No		
Undecided		

17. The diagram shows the amount of money spent in a shop plotted against the midday temperature, for 10 days.



A magazine headline states that 'Cold temperatures make people spend more money'. Does the diagram support this claim? Give a reason for your decision.

18. Five positive whole numbers have the following properties.

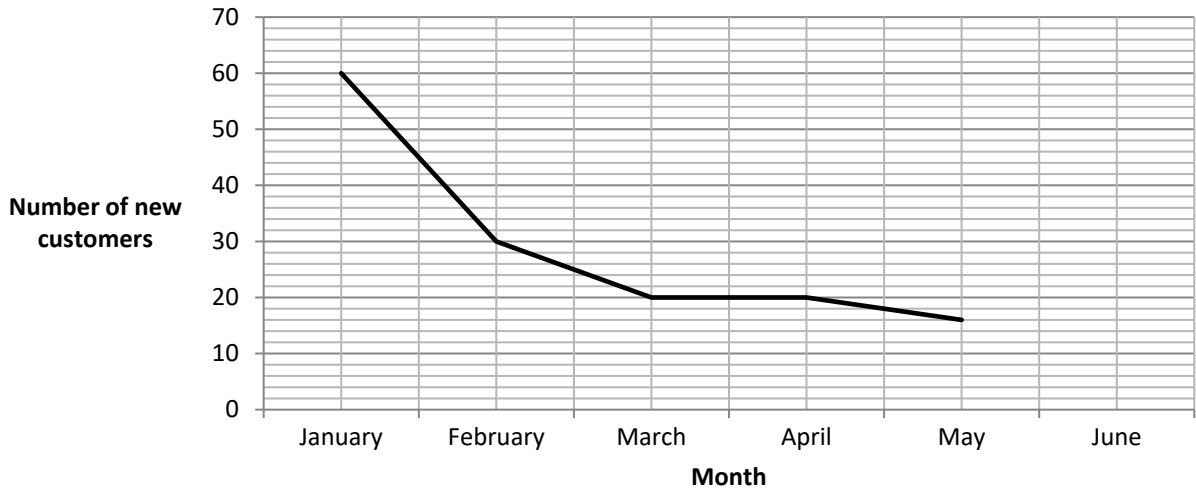
- All the numbers are less than 20.
- The mean of these numbers is 8.
- One of the numbers is even.
- The mode of these numbers is 9.
- Three of the numbers are prime numbers.

What are the five numbers?

MATHEMATICS

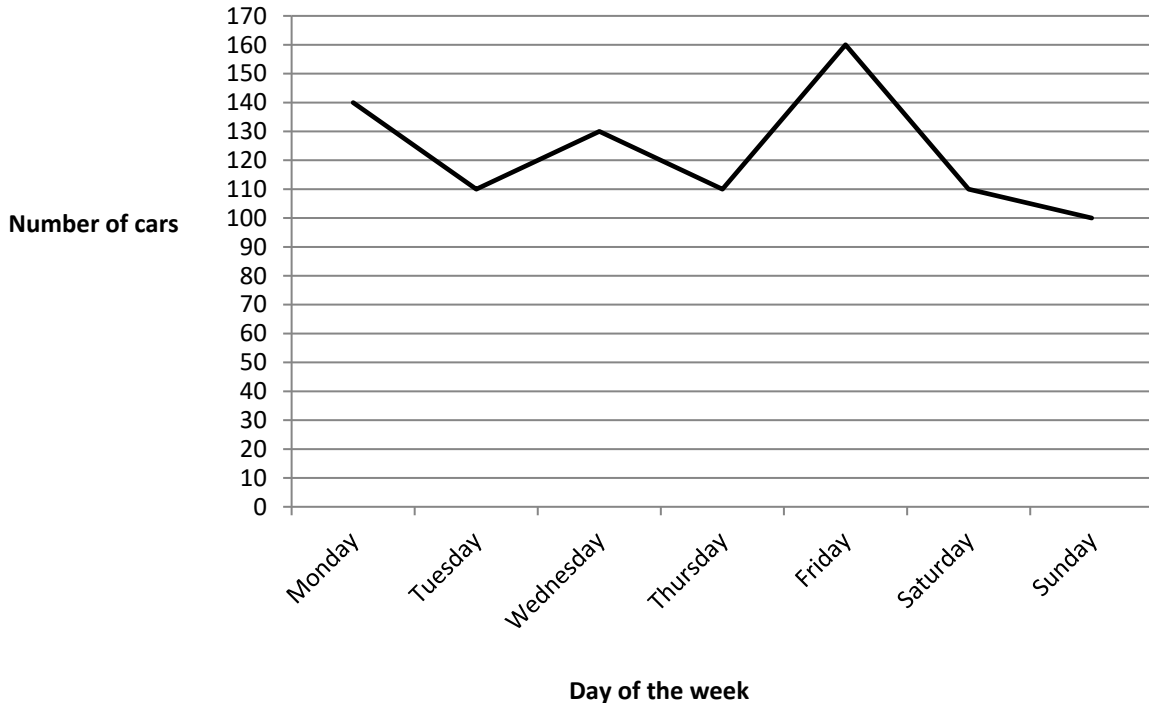
Section Check In

19. The time series graph shows the number of new customers at Oscar’s Gym for the first five months of the year.



The target for the first six months of the year is a mean of 28 new customers. What is the minimum number of new customers needed in June to meet this target?

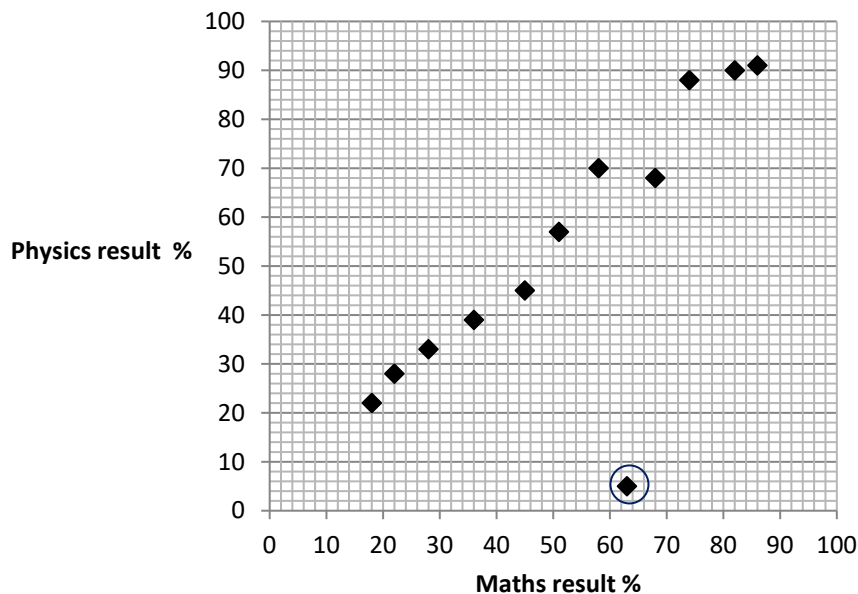
20. A council car park’s daily charges are £2.50 per car Monday to Friday and £1.00 per car Saturday or Sunday. The line chart shows the mean number of cars using the car park on each day of the week.



The council wishes to raise the car park’s mean income to at least £2000 per week. They propose raising the daily charge on Saturday and Sunday to £2.00 per car. Evaluate the proposal.

Answers

1. No correlation
2. £40
- 3.



4. False
5. The trend is that the number of customers is decreasing.
6. The modal class is 45-49.

Age	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Number of employees	5	1	5	2	3	7	3	1	3

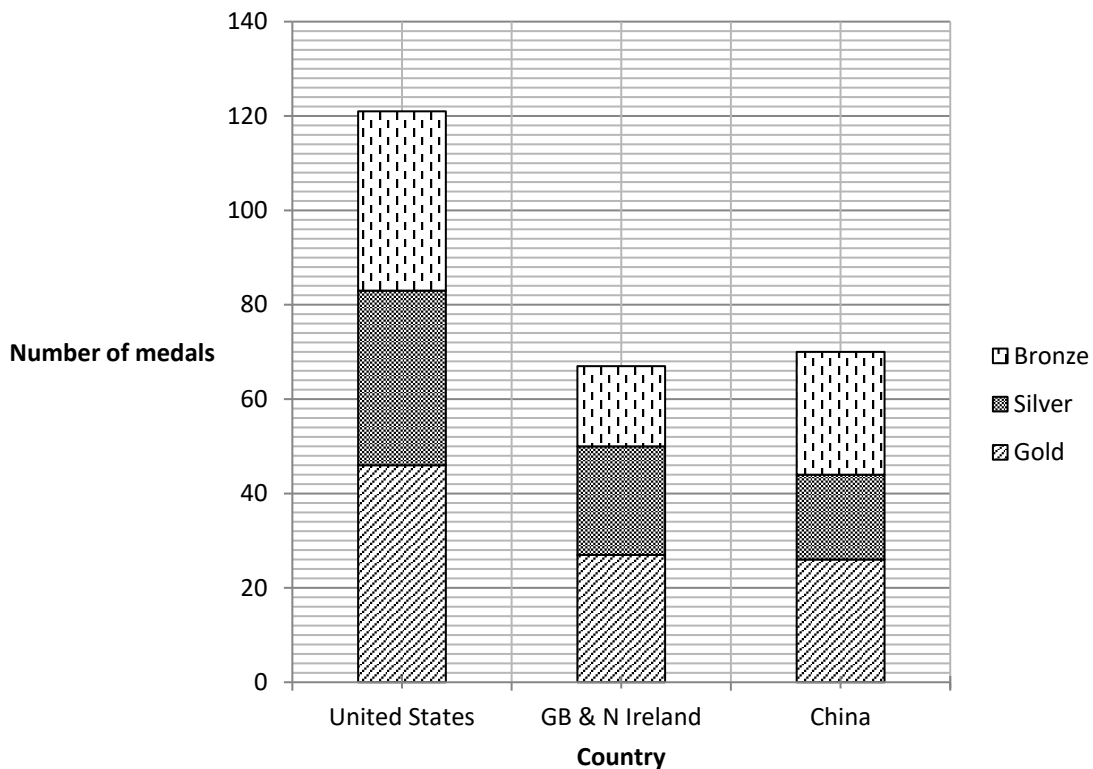
7. **Ian** Range = $16 - 8 = 8$ cars Mean = $(8 + 12 + 12 + 16) \div 4 = 48 \div 4 = 12$ cars
Alan Range = $20 - 4 = 16$ cars Mean = $(20 + 16 + 16 + 2) \div 4 = 56 \div 4 = 14$ cars

Alan has a higher mean over the four month period so on average he has sold more cars each month. Ian has a lower range so he is more consistent than Alan.

8.



9.



10. 65 kg as the six weights must add up to 420 kg (70×6). The other weights add up to 355 kg so the difference is $420 - 355 = 65$ kg.

11. Lester is not correct as he is describing sampling bias. Simple random sampling is when each member of the population has an equally likely chance of being chosen for the sample.

12. Matilda is not correct. If 50 students said reading, then the sector angle would be 100° , but the sector angle is less than 90° so less than 50 students said reading. The actual number of students who said reading was 40.

13. Mean = $240 \div 40 = 6$.

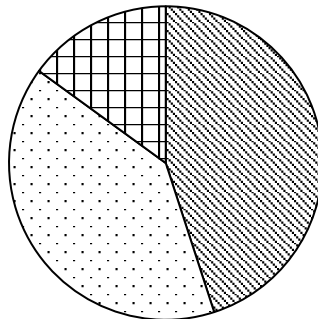
13 students out of 40 scored less than the mean mark = 32.5%, so he is incorrect.

14. The pictogram does not have a key. The pictures of the houses are different sizes, which may be misleading.

15. Lily is not correct as the range = $95 - 52 = 43$ bpm and the median = 83 bpm. She has calculated the mean rather than the median.

16.

Vote	Number of people	Size of angle
Yes	45	162°
No	40	144°
Undecided	15	54°



Yes
 No
 Undecided

17. No, there may be other factors involved e.g. day of the week, whether it rains, etc. The sample is only for 10 days and may not represent a longer period of time.

18. 2, 7, 9, 9 and 13 or 2, 3, 9, 9 and 17

19. January = 60, February = 30, March = 20, April = 20, May = 16, June = x .

$$\frac{60 + 30 + 20 + 20 + 16 + x}{6} = 28$$

$$146 + x = 6 \times 28$$

$$x = 168 - 146 = 22$$

20. At the current daily charges, the car park's mean income is £1810 per week. Doubling the weekend daily charge would increase the mean income to £2020 per week. However, the mean income may not be met if the increased charge deters existing customers.

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Describe correlation			
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AO1	3	Recognise outliers on a scatter diagram			
AO1	4	Understand the difference between population and sample			
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AO1	6	Complete a frequency table and identify the modal class of grouped data			
AO1	7	Calculate the range and mean and make simple comparisons			
AO1	8	Construct a time series graph			
AO1	9	Construct a composite bar chart			
AO1	10	Calculate the mean of ungrouped data			
AO2	11	Understand what is meant by simple random sampling and bias in sampling			
AO2	12	Interpret a pie chart			
AO2	13	Calculate and interpret the mean			
AO2	14	Recognise and explain graphical misrepresentation			
AO2	15	Understand and explain how to calculate the range and median of ungrouped data			
AO3	16	Solve a problem using pie charts			
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