# GCSE (9–1) MATHEMATICS

Higher Check In - 12.02 Interpreting and representing data

1. The table below shows information about the heights of the children in a class of 30 students. Find the missing values in the frequency and the cumulative frequency columns.

Height, h cm	Frequency	Cumulative frequency
$140 \leq h < 145$	2	2
$145 \leq h < 150$	5	a
$150 \leq h < 155$	x	b
$155 \leq h < 160$	7	c
$160 \leq h < 165$	3	d
$165 \leq h < 170$	1	e

2. A sports centre offers three types of membership: Junior, Standard and Senior. The multiple bar chart below shows the membership data for two consecutive years.
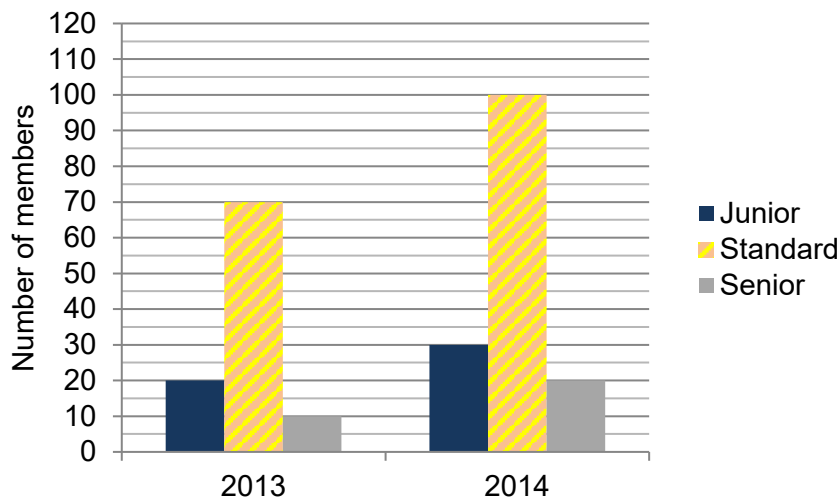

Work out which membership type has remained **proportionally** constant from 2013 to 2014.

3. Estimate the number of red cars parked at the station car park on Saturday given that 36 black cars were parked at the car park.
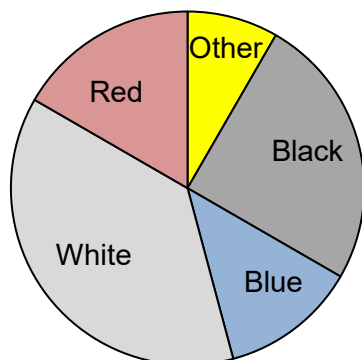
4. Ciara carried out a survey to determine the favourite juice flavours across the school. She found that $\frac{1}{3}$ chose apple juice, 25% chose orange juice and 60 students chose tropical juice. Represent this data as a pie chart.

5. The histogram shows the results of students that took a university entrance test. Given that 75 students scored more than 70%, how many students took the test in total?

Test scores
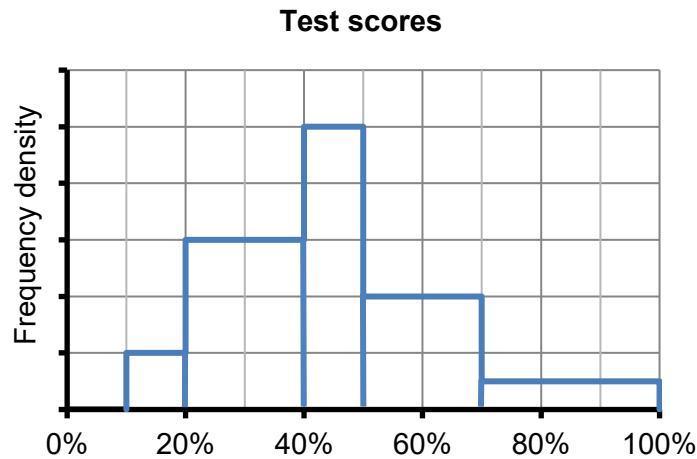
6. The two pie charts show the proportion of boys and girls that attended a gymnastics class in two consecutive weeks.

WEEK 1

☐ Girls
■ Boys

WEEK 2
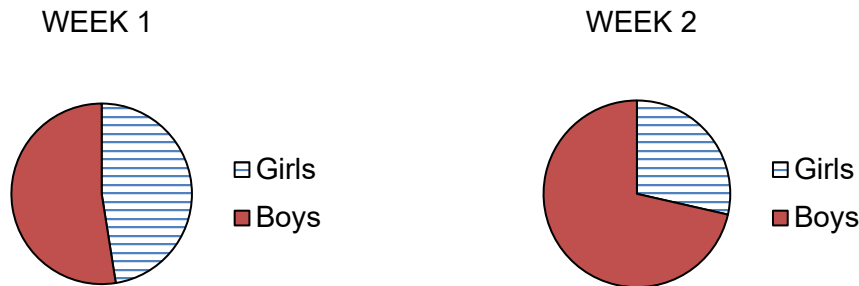
☐ Girls
■ Boys

Charlotte says "The number of girls attending gymnastics has gone down".
Explain why she might not be correct.

7. The graph shows the turnover in pounds (£) per month for a gift shop at a beach resort in the UK last year.
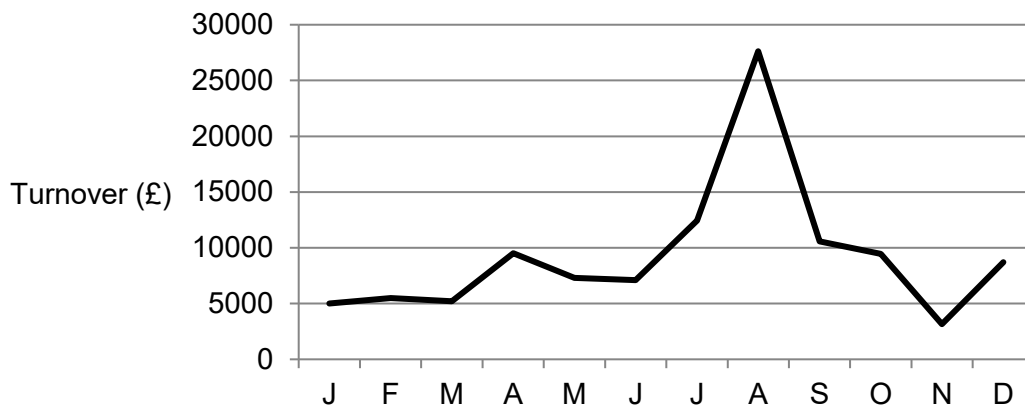
Describe the seasonal variations and explain why they might occur.

8. All the students in one year took a maths test. The percentage results are shown in the cumulative frequency graph below. The dashed line shows the results for the boys, the dotted line shows the results for the girls.
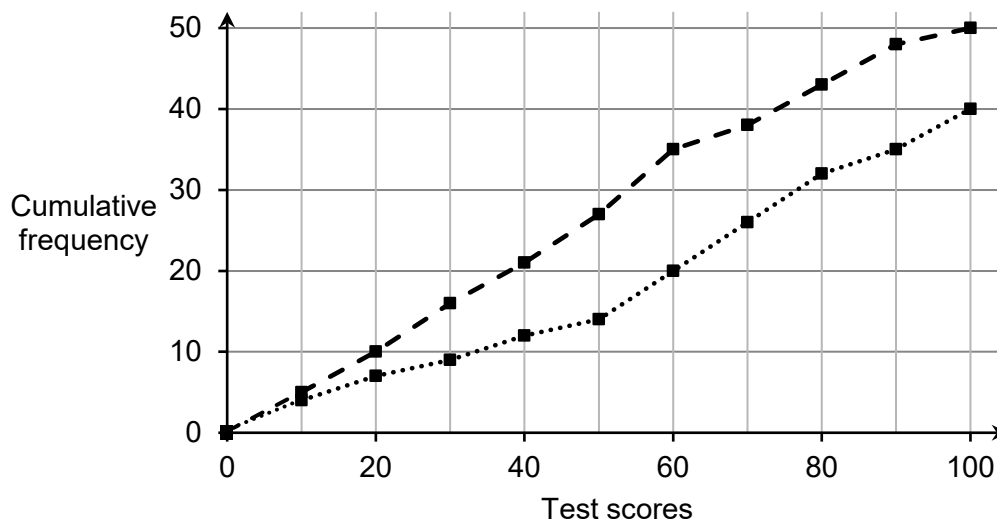

Give one difference between the boys and the girls' data.

9. Terry asked 200 students if they like badminton or squash or tennis best.
    - 124 of the students are boys.
    - 56 of these boys like tennis best.
    - 42 girls like badminton best.
    - 14 out of the 46 students who like squash best are girls.

    Work out the number of students who like badminton best.

10. The cumulative frequency graph below shows data from a science test for a year 11 cohort of students. Use the data to make an estimate of the mean for the test.

Science test results
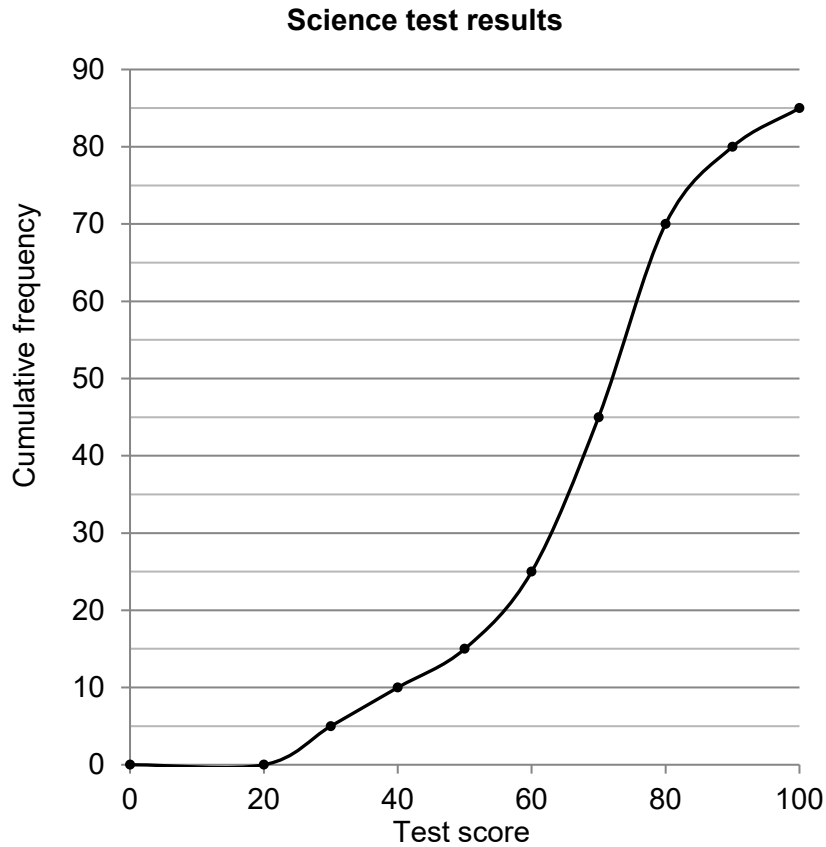
Extension

Choose a paragraph from one of your text books. Design a table to classify the words in the paragraph by both length and by whether they begin with a consonant or a vowel. Can you draw any conclusions from your findings?

Answers

1. $x = 12$, $a = 7$, $b = 19$, $c = 26$, $d = 29$, $e = 30$

2. Junior membership is 20% of the total membership in both years.

3. 24

4. Apple 120° [48], Orange 90° [36] and Tropical 150° [five twelfths of total].

Favourite juice

□ apple
■ orange
■ tropical

5. 875

6. Pie charts only show proportion, not actual numbers, so even though there was a smaller proportion of girls compared to boys in week 2, if the overall numbers attending were much higher, the actual numbers of girls could be more.

7. There is a small increase in sales in April and December and this could be because of the school holidays. There are generally more sales during the summer months as more people visit the beach during this time of year. There is a dramatic increase in turnover in August as a result of the school summer holidays.

8. More boys (50) than girls (40) took the test.
Median for the boys $=$ approximately 47, median for the girls $=60$. Therefore on average the girls performed better on the test.

9. 78

10. Mean 65.6%

Extension

Answers will vary from student to student.

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GCSE (9–1)
MATHEMATICS

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Complete a cumulative frequency table			
AO1	2	Calculate proportions from a multiple bar chart			
AO1	3	Estimate frequencies from a pie chart			
AO1	4	Determine proportions and construct a pie chart			
AO1	5	Calculate frequencies from a histogram			
AO2	6	Interpret pie charts			
AO2	7	Draw conclusions from a line graph for time series data			
AO2	8	Compare cumulative frequency curves			
AO3	9	Use a two-way table to solve a problem			
AO3	10	Estimate a mean from a cumulative frequency graph			

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