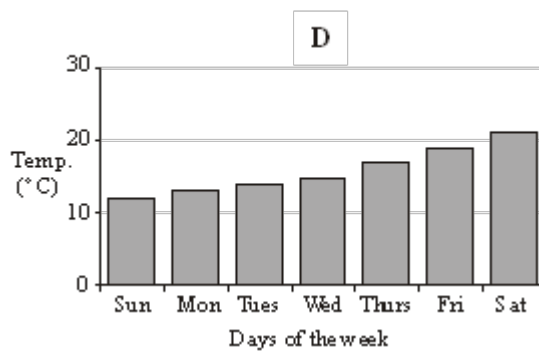
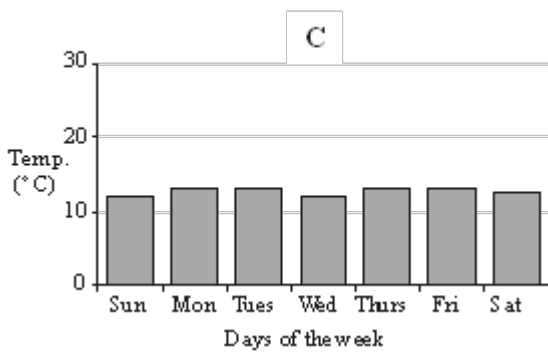
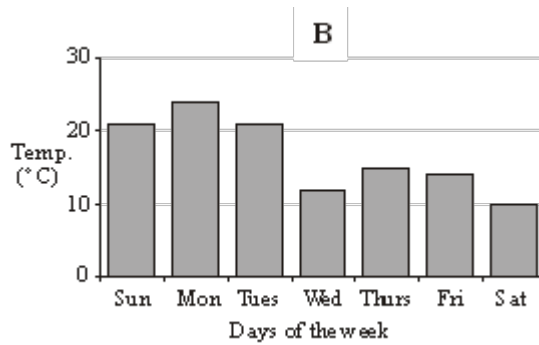
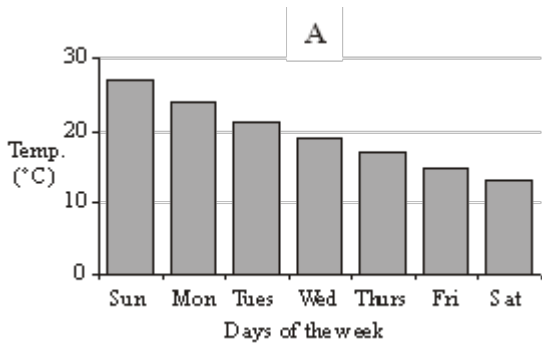


Q1. Here are four bar charts showing information about the temperatures at midday in four different cities last week.



Put a cross in the box underneath the letter of the bar chart which best matches the sentences.

One has already been done for you.

	A	B	C	D
(i) Each temperature at midday was higher than the day before.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(ii) Each temperature at midday was about the same.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(iii) Each temperature at midday was lower than the day before.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Total 2 marks)

Q2. Mr and Mrs Jones are planning a holiday to the Majestic Hotel in the Cape Verde Islands.

The table gives information about the prices of holidays to the Majestic Hotel.

MAJESTIC HOTEL, Cape Verde Islands		
Departures	Price per adult	
	7 nights	14 nights
1 Jan – 8 Jan	£ 694	£ 825
9 Jan – 28 Jan	£ 679	£ 804
29 Jan – 5 Feb	£ 687	£ 815
6 Feb – 18 Feb	£ 769	£ 835
19 Feb – 8 Mar	£ 714	£ 817
9 Mar – 31 Mar	£ 685	£ 805
1 Apr – 9 Apr	£ 788	£ 862
10 Apr – 30 Apr	£ 748	£ 802

Price per child: 95% of adult price for 7 nights or 85% of adult price for 14 nights.

Mr and Mrs Jones are thinking about going on holiday

on 20 February for 7 nights
or on 10 April for 14 nights.

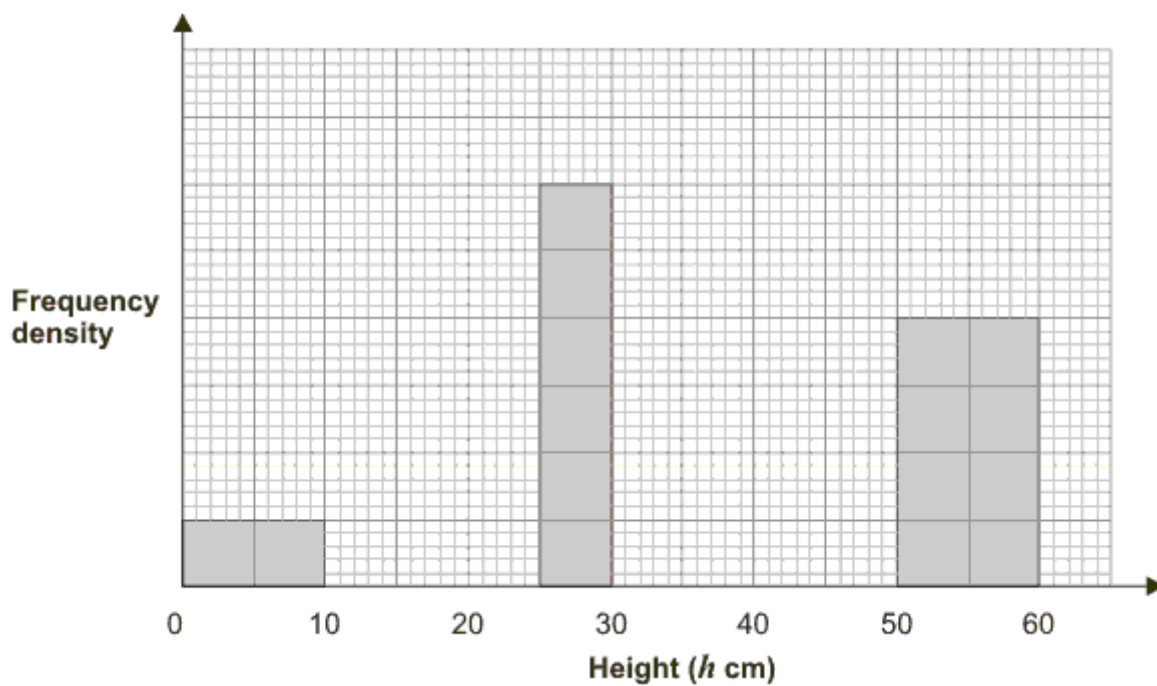
Mr and Mrs Jones have 2 children.

Compare the costs of these two holidays for the Jones family.

(Total 5 marks)

Q3. The incomplete frequency table and histogram give some information about the heights, in centimetres, of some tomato plants.

Height (h cm)	Frequency
$0 < h \leq 10$	
$10 < h \leq 25$	30
$25 < h \leq 30$	
$30 < h \leq 50$	50
$50 < h \leq 60$	20



(a) Use the information in the histogram to complete the table.

(2)

(b) Use the information in the table to complete the histogram.

(2)

(Total 4 marks)

Q4. The table shows some information about the weights, in grams, of 60 eggs.

Weight (w grams)	Frequency		
$0 < w \leq 30$	0		
$30 < w \leq 50$	14		
$50 < w \leq 60$	16		
$60 < w \leq 70$	21		
$70 < w \leq 100$	9		

(a) Calculate an estimate for the mean weight of an egg.

..... g

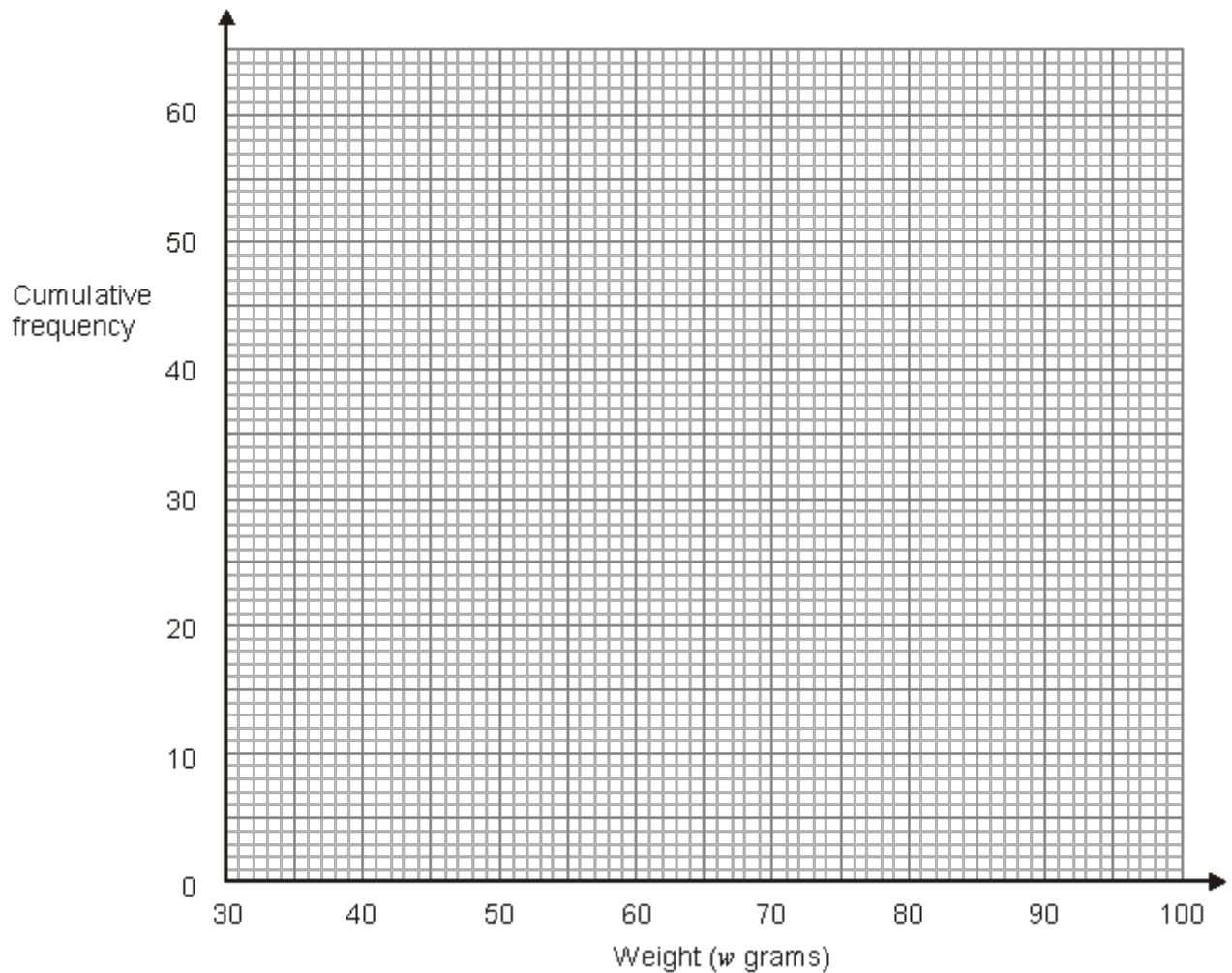
(4)

(b) Complete the cumulative frequency table.

Weight (w grams)	Cumulative frequency
$0 < w \leq 30$	0
$0 < w \leq 50$	
$0 < w \leq 60$	

$0 < w \leq 70$	
$0 < w \leq 100$	

(1)



(c) On the grid, draw a cumulative frequency graph for your table.

(2)

(d) Use your graph to find an estimate for the number of eggs with a weight greater than 63 grams.

.....

(2)
(Total 9 marks)

Q5. Kelly recorded the length of time 48 teachers took to travel to school on Monday.

The table shows information about these travel times in minutes.

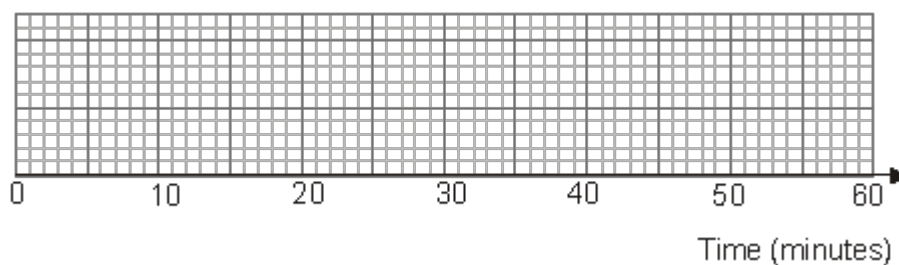
Least time	5
Greatest time	47
Median	28
Lower quartile	18
Upper quartile	35

(a) Work out the number of teachers with a travel time of 35 minutes or more.

.....

(2)

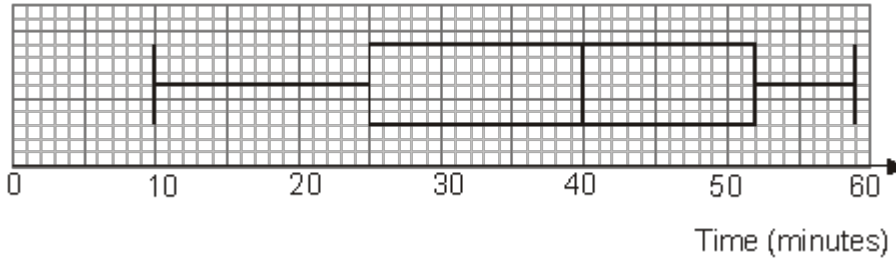
(b) On the grid, draw a box plot to show the information in the table.



(2)

Kelly then recorded the times the same 48 teachers took to travel to school on Tuesday.

The box plot shows some information about these times.



(c) Compare the travel times on Monday and on Tuesday.

.....

.....

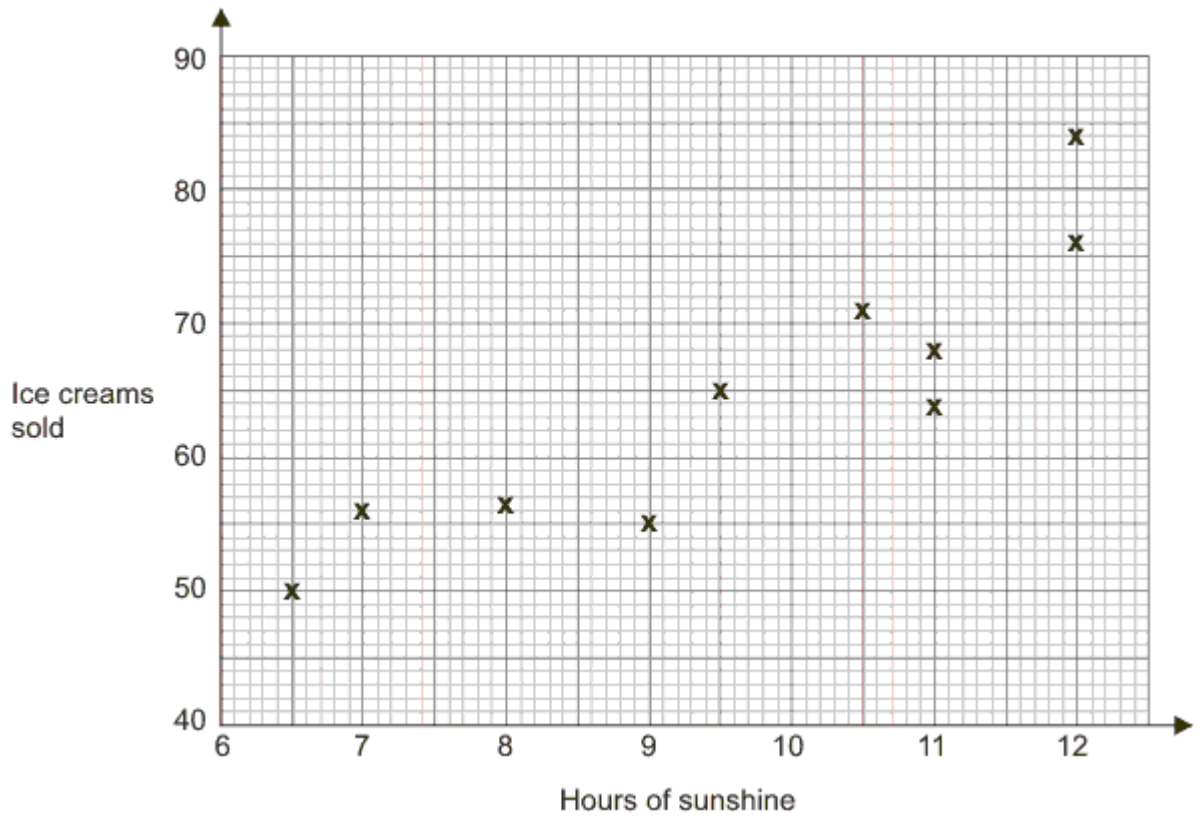
.....

.....

(2)
(Total 6 marks)

Q6. A beach cafe sells ice creams.
Each day the manager records the number of hours of sunshine and the number of ice creams sold.

The scatter graph shows this information.



On another day there were 11.5 hours of sunshine and 73 ice creams sold.

(a) Show this information on the scatter graph.

(1)

(b) Describe the relationship between the number of hours of sunshine and the number of ice creams sold.

.....

(1)

One day had 10 hours of sunshine.

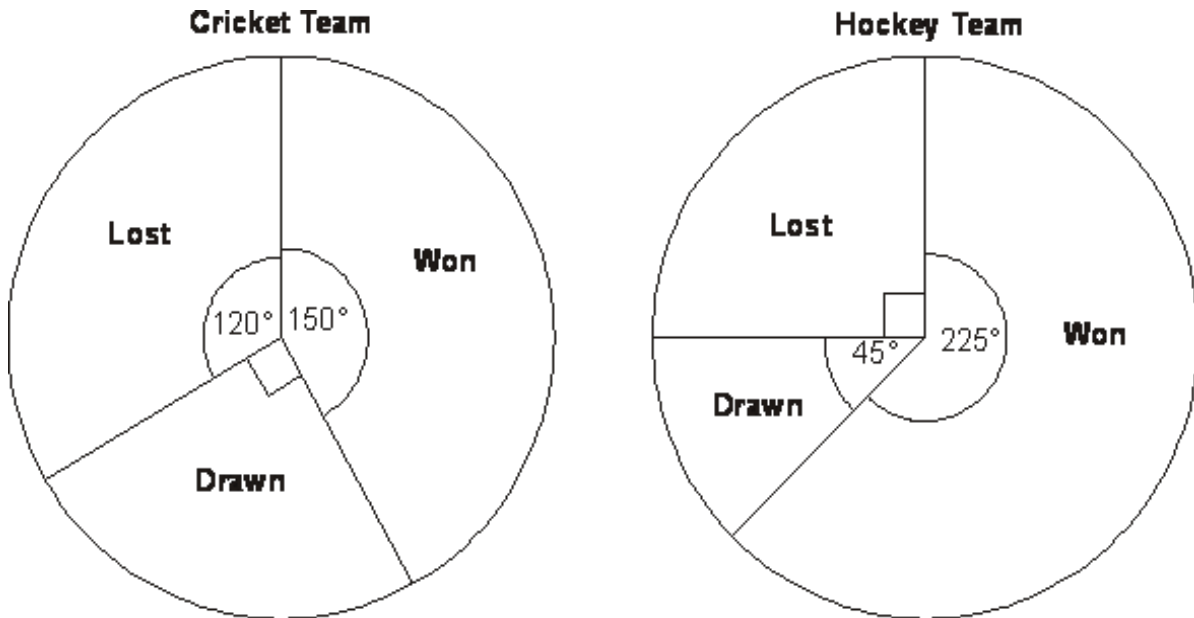
(c) Estimate how many ice creams were sold.

.....

(2)

(Total 4 marks)

Q7. The pie charts show some information about the numbers of matches won, drawn and lost by a cricket team and by a hockey team last year.



The cricket team won 15 matches.

(a) How many matches did the cricket team lose?

.....

(2)

(b) Which team won the most matches last year?
Tick (✓) **one** box to show your answer.

Cricket

Hockey

Not enough information

Explain your answer.

.....

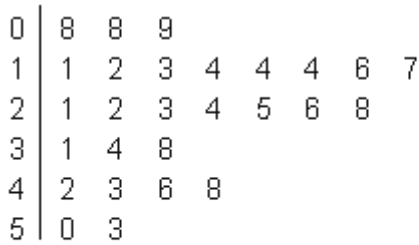
.....

.....

.....

(1)
(Total 3 marks)

Q8. The stem and leaf diagram shows information about the ages, in years, of the people on a fairground ride.



Key: 4|2 means 42 years

(a) How many people were on the fairground ride?

.....

(1)

(b) Work out the median age.

.....

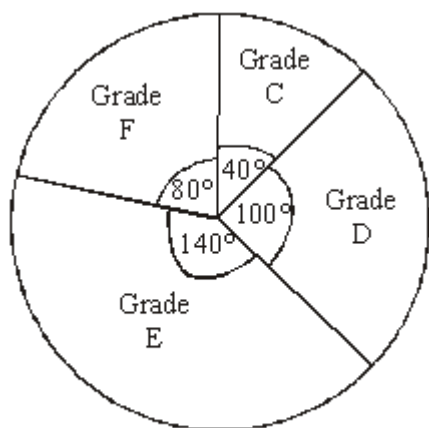
(1)

- (c) Work out the range of the ages.

.....

(2)
(Total 4 marks)

- Q9.** The pie chart gives information about the mathematics exam grades of some students.



Mathematics exam grades

Diagram **NOT** accurately drawn

- (a) What grade was the mode?

.....

(1)

- (b) What fraction of the students got grade D?

..... (1)

8 of the students got grade C.

(c) (i) How many of the students got grade F?

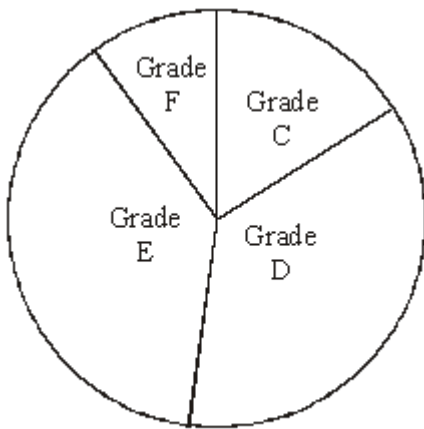
.....

(ii) How many students took the exam?

.....

(3)

This accurate pie chart gives information about the English exam grades for a different set of students.



English exam grades

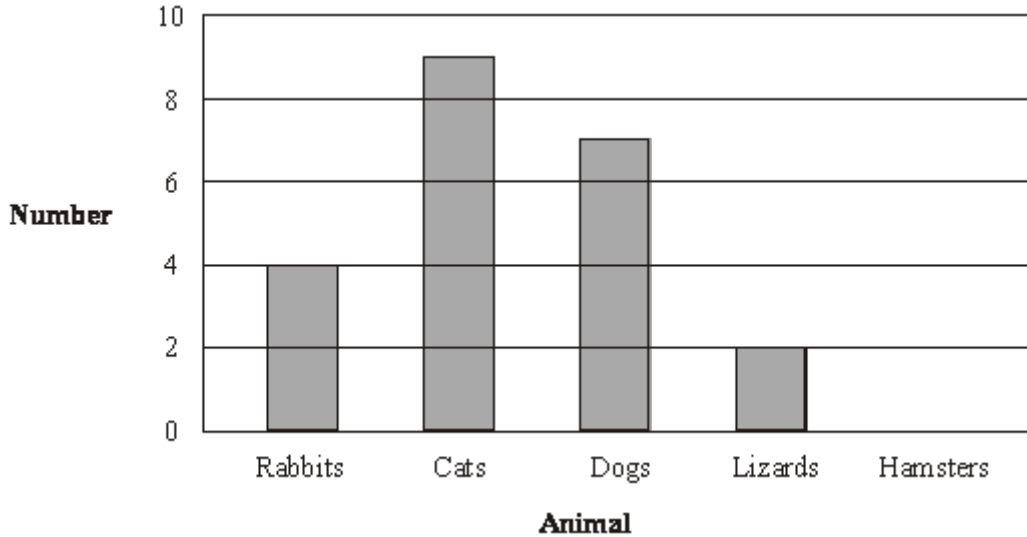
Sean says "More students got a grade D in English than in mathematics."

(d) Sean could be **wrong**.
Explain why.

.....
.....

(1)
(Total 6 marks)

Q10. This bar chart gives information about the numbers of rabbits, cats, dogs and lizards taken to a vet on Monday.



(a) Write down the number of rabbits taken to the vet on Monday.

.....

(1)

(b) Write down the number of dogs taken to the vet on Monday.

.....

(1)

5 hamsters were also taken to the vet on Monday.

(c) Use this information to complete the bar chart.

(1)

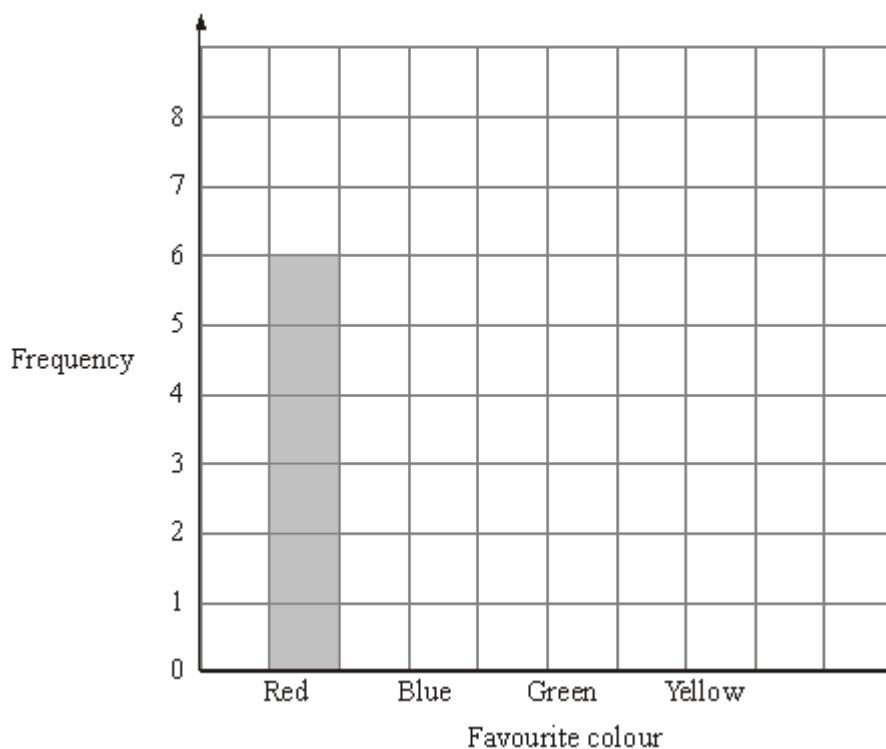
(Total 3 marks)

Q11. Steve asked his friends to tell him their favourite colour.

Here are his results.

Favourite colour	Tally	Frequency
Red		6
Blue		8
Green		5
Yellow		3

(a) Complete the bar chart to show his results.



(2)

(b) Which colour did most of his friends say?

.....

(1)

(Total 3 marks)

Q12. The table shows the distances in kilometres between 5 cities.

Hull				
100	Leeds			
162	73	Manchester		
110	60	65	Sheffield	
63	40	118	95	York

(a) Write down the distance between Hull and Manchester.

..... km

(1)

(b) From the table, write down the name of the city which is

(i) nearest to Hull,

.....

(ii) 60 km from Sheffield.

.....

(2)

(Total 3 marks)

Q13. Here is part of a train timetable from Peterborough to London.

Station	Time of leaving
Peterborough	08 44

Huntingdon	09 01
St Neots	09 08
Sandy	09 15
Biggleswade	09 19
Arlesey	09 24

(a) Which station should the train leave at 09 01?

.....

(1)

The train arrives in Sandy at 09 12

(b) How many minutes should the train wait in Sandy?

..... minutes

(1)

The train should take 41 minutes to travel from Arlesey to London.

(c) What time should the train arrive in London?

.....

(1)
(Total 3 marks)

M1.

	Answer	Mark	Additional Guidance
(i)	C	2	B1 for each correct answer
(ii)	A		
Total for Question: 2 marks			

M2.

Working	Answer	Mark	Additional Guidance
$714 \times 2 = 1428$ $714 \times 0.95 = 678.30$ $678.30 \times 2 = 1356.60$ $1428 + 1356.60 = 2784.60$ $802 \times 2 = 1604$ $802 \times 0.85 = 681.70$ $681.70 \times 2 = 1363.40$ $1604 + 1363.40 = 2967.40$	Comparison	5	<p>B1 for identifying 714 and 802</p> <p>M1 for $\frac{95}{100} \times '714'$ oe or $\frac{85}{100} \times '802'$ oe</p> <p>M1 for $2 \times$ 'adult' + $2 \times$ 'child' oe for at least one holiday</p> <p>A1 for 2784.6(0) and 2967.4(0) or 2785 and 2967</p> <p>C1 for comparing the costs of their two holidays for 2 adults and 2 children and clearly indicating which is cheaper. Conclusion must clearly follow from working. QWC: Decision and justification should be clear with working clearly presented and attributable. (allow full marks for a candidate who has calculated the cost per day for each holiday (397.8(0) and 211.95(7..)) and compares these costs accordingly.)</p>
Total for Question: 5 marks			

M3.

	Answer	Mark	Additional Guidance
(a)	5 15	2	B1 cao B1 cao
(b)	fd = 2 (ht 4 cm) fd = 2.5 (ht 5 cm)	2	B2 for 2 correct bars B1 for 1 correct bar If B0 is scored then you can award M1 at least one correct frequency density calculated for the missing bars Or 1 sq = 2.5 plants oe
Total for Question: 4 marks			

M4.

	Working	Answer	Mark	Additional Guidance
(a)	15 × 0 = 0 40 × 14 = 560 55 × 16 = 880 65 × 21 = 1365 85 × 9 = 765 3570 ÷ 60	59.5	4	M1 for finding at least 4 products fx consistently within interval (including end points) M1 (dep) for use of at least 4 correct midpoints M1 (dep on first M) for " Σfx " ÷ 60 A1 for 59.5
(b)		14, 30, 51, 60	1	B1 all 4 correct
(c)			2	M1 for at least 4 of "5 points" plotted consistently within each interval, ± 0.5 full square, and joined by curve or line segments providing no gradient is negative. A1 for a fully correct cf graph.

(d)			2	B2 for answer in the range 21 – 25 (B1 for answer in the range 35 – 39) OR M1 (dep on graph being cf) for using $w = 63$ A1 ft (± 0.5 square)
				Total for Question: 9 marks

M5.

	Working	Answer	Mark	Additional Guidance
(a)	$48 \div 4$	12	2	M1 $48 \div 4$ or $49 \div 4$ or $48 - 36$ A1 for 12
(b)		Box plot drawn	2	B2 fully correct box plot (B1 for the box plot drawn with one plotting error)
(c)		On Tuesday: Median higher (IQ) Range higher.	2	B1 for median higher on Tuesday or journeys took longer on Tuesday B1 for (IQ) range higher on Tuesday or more variation in journey length on Tuesday. (NB: For B2 at least one comparison must be in context)
				Total for Question: 6 marks

M6.

	Answer	Mark	Additional Guidance
--	--------	------	---------------------

(a)	Point at (11.5, 73)	1	$\pm \frac{1}{2}$ B1 Point plotted $\pm \frac{1}{2}$ small square
(b)		1	B1 for description of dynamic relationship eg "the more hours of sunshine, the more ice creams sold" or positive correlation [Note: 'sunnier' implies 'more hours of sunshine']
(c)	62 – 70	2	B2 for answer in the range 62 – 70 OR M1 for a single straight line of best fit with positive gradient, passing between (6.5, 45), (6.5, 59) and (12, 70), (12, 80) or a vertical line drawn from 10 A1 for answer in range 62 – 70 or ft from single straight "line of best fit" with positive gradient
Total for Question: 4 marks			

M7.

	Working	Answer	Mark	Additional Guidance
(a)	15 matches = 150° 1 match = 10° 120 ÷ 10 = 12	12	2	M1 for 150 ÷ 15 (=10) or 120 ÷ 10 [Note: 10 seen on the answer line with no working gets no marks] A1 cao
(b)		Not enough information ticked and reason given	1	B1 for "Not enough information" ticked (or not and not contradicted) and correct explanation eg Explains that we don't know actual number of matches hockey team won. OR explains we don't know number of matches. OR explains that pie charts only show the proportions (eg. "cannot compare sizes of angles only") [B0 for any contradictory responses]
Total for Question: 3 marks				

M8.

	Working	Answer	Mark	Additional Guidance
(a)		27	1	B1 cao
(b)	$(27 + 1)/2 = 14$ so 14th is median value	23	1	B1 cao
(c)	$53 - 8$	45	2	M1 for $53 - 8$ A1 cao [SC: B1 for 8 to 53 or $8 - 53$ oe or 8 and 53 identified if M0 A0 awarded]
Total for Question: 4 marks				

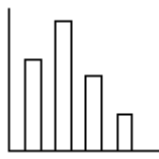
M9.

	Working	Answer	Mark	Additional Guidance
(a)		Grade E	1	B1 for E, e Grade E, e, or 140°
(b)		100/360	1	B1 5/18 oe
(c)(i)	$8 \times 2 = 16$	16	3	B1 cao
(ii)	$360/40 \times 8 = 72$	72		M1 $360/40 \times 8$ oe, or $360/80 \times "16"$ oe, or "16" $\times 4.5$ or attempts to find an association eg $8 + 16 + 20 + 28$ A1 cao or ft from (i)
(d)		Reason	1	B1 reason (eg %, not actual numbers; do not know how many students, etc)
Total for Question: 6 marks				

M10.

	Answer	Mark	Additional Guidance
(a)	4	1	B1 cao
(b)	7	1	B1 cao
(c)	Bar at 5	1	B1 cao. Bars may be narrow, but cannot be so narrow as to be a “bar line”.
Total for Question: 3 marks			

M11.

	Working	Answer	Mark	Additional Guidance
(a)		Bars drawn at heights 8, 5 and 3	2	B2 for 3 bars drawn correctly (B1 for one bar drawn correctly or for 3 bars with correct heights)
(b)		Blue	1	B1 ft for “blue” (ft from table or their bar chart)
Total for Question: 3 marks				

M12.

	Answer	Mark	Additional Guidance
(a)	162	1	B1 for 162 cao
(b)(i)	York	2	B1 for York cao
(ii)	Leeds		B1 for Leeds cao
Total for Question: 3 marks			

M13.

	Answer	Mark	Additional Guidance
(a)	Huntingdon	1	B1 cao
(b)	3	1	B1 cao
(c)	10 05	1	B1 cao
Total for Question: 3 marks			

- E1.** This question was done well by many candidates. Most were able to identify bar chart C for statement (ii), but a common incorrect answer for statement (iii) was B.

##

Foundation

As with Q2 (d) some candidates showed little understanding of an appropriate amount for the cost of a holiday, including one of $\text{£}714 \times 95 \times 95 (= \text{£ } 6443850)$ per child. The instruction to 'compare' seems to have confused most since they only found the difference between the prices and made no other comment. Candidates who gained four marks for the prices often did not complete their answer for the fifth mark. The majority of candidates attempted this question. Only one or two managed to gain full marks and the majority gained one mark for recognising 714 and 802. The vast majority of candidates could not work out the percentages, and attempted to use the chunking and combining method which led them to make errors, which meant they could not gain the method mark, though most did attempt to produce a costing for two adults and two children. Again for a calculator paper the candidates did not appear to use one for this question. A lot of the candidates did multiply their adult and children's prices by two and add but again they did not make the comparison required for the final C1 mark.

Higher

This question discriminated well between candidates. Most candidates earned some credit for their response to the question and just under a quarter of candidates scored full marks. Candidates usually selected the correct prices from the table. It is surprising that, at the higher tier, in a paper where the use of a calculator is expected, the majority of candidates used a "build up" method to work out percentages rather than using a "multiplier method". Many of these candidates failed to obtain the mark for working out an appropriate percentage because they were unable to evaluate the percentage correctly and did not explain their method in sufficient detail to convince examiners. Other candidates read "of" as "off" and subtracted 95% and 85% from the adult prices to obtain the price per child. Candidates did not always work out the costs of the holiday for all four members of the family, some being content just to compare the costs for adults only or for 2 adults and 1 child. A significant number of candidates who successfully found the correct total cost of each holiday did not compare their answers and so could not be awarded the mark available for quality of written communication. Calculating the difference in prices without saying which is cheaper was not accepted as a comparison. Some candidates gave a valid comparison based on a "best buy" basis of the cost per day for each holiday. Rounding errors led to some candidates losing marks.

##

In (a), most candidates were able to find the first frequency, but a frequency of 30 was common for the second value in the table. Other wrong responses often seen were 10 and 30 or 50 and 150.

Many candidates left part (b) blank or produced answers with bars drawn off the graph or very tiny. Also, some candidates just drew bars of frequency 30 and 50, so in effect a bar chart with different size widths. Other candidates were able to calculate the frequency density correctly, so picked up a M1 mark, but then were unable to draw the two bars required.

In general candidates appear not to be aware that the area of the bars of a histogram are the frequencies, evidenced by a lack of frequency density calculations. A few of them had used $1 \text{ sq. cm} = 2.5$ to calculate the frequencies and the drawing of the bars but this was rarely seen.

##

In part (a) many candidates scored the 2 marks for obtaining the products of the midpoints and the frequencies, showing correct calculations for at least 4 of the 5 products fx and using the correct midpoints. The most common error seemed to be $15 \times 0 = 15$. After gaining the first two marks many went on to add and then divide by 60 but division by 260 or 5 were common errors. In some cases it was clear that candidates did not know how to approach this question and instead used the columns to calculate cumulative frequency or frequency density.

Part (b) was answered correctly by a majority of candidates although a few did not seem to know what was required and listed midpoints or worked out frequency density. Even though candidates had a calculator, again arithmetic errors were seen.

In part (c) students generally managed to plot the points that they had identified in (b) correctly but many lost the marks as they failed to join the points. Points were sometimes badly joined particularly the last two often resulting in a curve which contained a negative gradient. Encouragingly the plotting at midpoints was rarely seen.

Many candidates who had a cumulative frequency graph understood what to do in part (d), although a few had difficulty reading the vertical axis with 36 or 37 being read as 46 or 47. Some failed to read the question carefully and so did not subtract their value from 60 so giving an answer for a weight less than 63 grams rather than more than.

##

In part (a), candidates appeared to find this question challenging. Some scripts were blank

and many had the answer of 12 but it clearly came from incorrect working usually, the calculation $47 - 35$ (greatest time – upper quartile), and so scored no marks. Some candidates calculated 75% of 48 to give 36 but then failed to subtract this from 48.

The majority of candidates attempted the box plot and usually scored full marks for part (b). The most common error was plotting 48 not 47 or omitting the median.

In part (c) many candidates concluded that journey times were longer on Tuesday than they were on Monday or that the median time was higher. However comparison of range or interquartile range was less common. Unfortunately many just listed times for Monday and times for Tuesday without making any comparison. One mark was often awarded for a correct comparison and the second mark not awarded as no context was offered for these comparisons.

##

Foundation

This question was answered well by very many candidates, although it was alarming to see some fundamental errors in the plotting of the additional information in part (a). Many candidates also missed out the plot completely possibly because the lack of an answer line meant they went straight on to (b) without being aware of the demands of (a). In part (b), candidates needed to relate the amount of sunshine with the number of ice creams sold to be able to score the mark, descriptions such as 'the hotter it is the more ice creams are sold', which was a common answer, gained no credit. An alternative approach saying positive correlation was also acceptable but merely saying the relationship was positive was not enough.

In (c), few candidates showed any working, eg line of best fit, and either scored full marks for an answer within the given range or no marks at all. Those that drew a line of best fit often just joined the last point to the origin and were out of tolerance, but still then didn't use it to find an answer.

Higher

The majority of candidates were able to answer (a) correctly. Occasionally (11.5, 73) was not plotted or on the wrong y coordinate, otherwise very well done.

In part (b) most candidates described a dynamic relationship correctly with a minority using the words 'positive correlation'. A few though talked in terms of the gradient of the line rather than interpreting the relationship in correlation terms. Additionally a few candidates stated negative correlation or some used the phrase 'hotter' instead of hours of sunshine.

In part (c), the majority of candidates gained 2 marks. Where a line of best fit was drawn, it rarely failed to be within limits and candidates were usually successful in finding a correct answer. A substantial number did not draw a line of best fit however even then, the majority of answers were within range. Errors were often made by misreading the y-axis, common to see 67 marked with 77 on the answer line. Insufficient candidates drew the line $x = 10$ up to the 'line' and across.

##

A correct answer of 12 was seen more than it was not in part (a), 10 being the most popular incorrect answer seen. It was rare to see any working shown and so candidates usually earned the full two marks or no marks at all.

In part (b), 'Hockey' was selected as the team that won the more matches, candidates simply comparing the size of the respective sectors.

##

Part (a) was generally correctly answered, careless rather than conceptual errors accounting for the greater number of mistakes.

Part (b) was poorly answered, clearly showing a lack of understanding of the ordering of information in a stem and leaf diagram. 3 and 22.5 were the most common errors here.

Only a half of the candidature was able to correctly find the range in part (c).

$50 - 8 = 42$ and $53 - 9 = 44$ were the usual errors together with $5 - 0 = 5$. Even when the readings of 53 and 8 were correctly achieved many didn't appreciate that they needed the difference and merely stated the two extremities.

E9. Part (a) was well answered, but few candidates gained the mark in part (b). Many attempted to estimate the fraction of the diagram, hence many gave $\frac{1}{4}$ or $\frac{1}{3}$ as the answer. Of those who used the 100° , the error for many was in giving it out of a number other than 360° .

In part (c) most candidates gained some credit, sometimes by showing evidence of using inventive methods. Some found and used a scaling factor such as 4.5. Others found an association using the relationship of the angles, showing $8 + 16 + 20 + 28$, or equivalent methods.

Part (d) was a discriminator, and it was encouraging to find half the candidates were able to distinguish between proportion and actual values, giving an acceptable explanation why Sean was wrong.

- E10.** This was a well answered question with most candidates scoring full marks. Zero marks in any section were usually due to non-attempts.
- E11.** Both parts of this question were answered very well indeed. Few marks were lost in the completion of the bar chart in part (a) and where they were it was more often because of incorrect widths or placement of the bars rather than the heights of the bars. A small number of candidates either gave the answer '8' rather than 'blue' in part (b) or gave no answer at all.
- E12.** The level of success in this question was both surprising and disappointing with many candidates unable to interpret the mileage chart correctly. Less than one third of the candidates found the correct distance between Hull and Manchester in part (a). Many assumed that the figures in the third row of the table related to Manchester so that the most common incorrect answers were 110 and 45 (from $110 - 65$). Part (b)(i) was answered more successfully with just under half of the candidates identifying York as the city nearest to Hull. The most common incorrect answer was Leeds, which was next to Hull in the table. Most success was achieved in part (b)(ii) with almost three quarters of candidates giving the correct answer.
- E13.** Over 90% of the candidates got the first two parts correct but many struggled with part (c). The most common error was 0965. Also seen were numbers close to the correct answer, out by one or ten minutes.

