NAME: ……

Foundation/Higher GCSE Mathematics Revision Pack

DATA HANDLING – CALC

Q1. A shop sells mobile phones.
The table shows the number of mobile phones sold each month from January to May.

Jan	Feb	Mar	Apr	May
70	64	73	85	91

(a) Work out the percentage increase in the number of mobile phones sold from April to May. Give your answer correct to 3 significant figures.

..... %

(3)

(b) Work out the 3-month moving averages for the information in the table.
The first one has been worked out for you.

.....69..... ....

(2)
(Total 5 marks)

Q2. Harry and Edith are planning their holiday. They want to travel by airplane.
They can travel with one of three airplane companies, Aireways, King Lingus or Easy Plane.
The tables show the cost per adult and the cost per child to travel with each airplane company.

Aireways

		July				August			
Week		1 – 8	9 – 15	16 – 22	23 – 31	1 – 12	13 – 19	20 – 26	27 – 31
Adult	AM	£197	£200	£215	£215	£224	£209	£199	£188
	PM	£174	£177	£192	£192	£201	£186	£176	£165
Child	AM	£110	£113	£128	£128	£137	£122	£112	£101
	PM	£87	£90	£105	£105	£114	£99	£89	£78

King Lingus

		July				August			
Week		1 – 8	9 – 15	16 – 22	23 – 31	1 – 12	13 – 19	20 – 26	27 – 31
Adult	AM	£193	£195	£197	£211	£220	£213	£208	£204
	PM	£176	£178	£180	£191	£203	£196	£191	£187
Child	AM	£119	£121	£123	£134	£146	£139	£134	£130
	PM	£102	£104	£106	£117	£129	£122	£117	£113

Easy Plane									
		July				August			
Week		1 – 8	9 – 15	16 – 22	23 – 31	1 – 12	13 – 19	20 – 26	27 – 31
Adult	AM	£198	£206	£213	£223	£232	£214	£210	£205
	PM	£181	£189	£196	£206	£215	£197	£193	£188
Child	AM	£94	£102	£109	£119	£128	£110	£106	£101
	PM	£77	£85	£92	£102	£111	£93	£89	£84

Harry and Edith have 3 children. They want to travel on the morning of 27th July.

Work out the cheapest cost.

.....

(Total 6 marks)

Q3. The pie chart shows some information about the numbers of medals won by Canada in the 2008 Olympic Games.

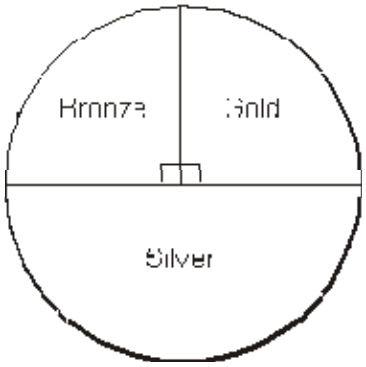
Canada won 3 gold medals.

(a) Work out the **total** number of medals Canada won.

.....

(2)

The pie chart below shows some information about the numbers of medals won by Canada in the 2004 Olympic Games.



Maria says
"The pie charts show that Canada won the same number of silver medals in 2008 as in 2004".

(b) Is Maria correct? Yes ☐ No ☐

Explain your answer.

(1)
(Total 3 marks)

Q4. Some students did a test. Here are their scores.

Boys' scores	27	20	12	28	35	28	37		
Girls' scores	29	31	35	15	18	25	35	27	40

Compare fully the scores of these students.

(Total 6 marks)

Q5. Charles wants to find out how much people spend on sweets.

He will use a questionnaire.

(a) Design a suitable question for Charles to use in his questionnaire.

(2)

Charles asks the people in his class to do his questionnaire.

(b) Give a reason why this may not be a suitable sample.

(1)
(Total 3 marks)

Q6. Nadine asked 50 people which of the newspapers the Times, the Guardian and the Telegraph they like best. Here is information about her results.

19 out of the 25 males said they like the Telegraph best.
5 females said they like the Guardian best.
4 out of the 7 people who said they like the Times best were female.

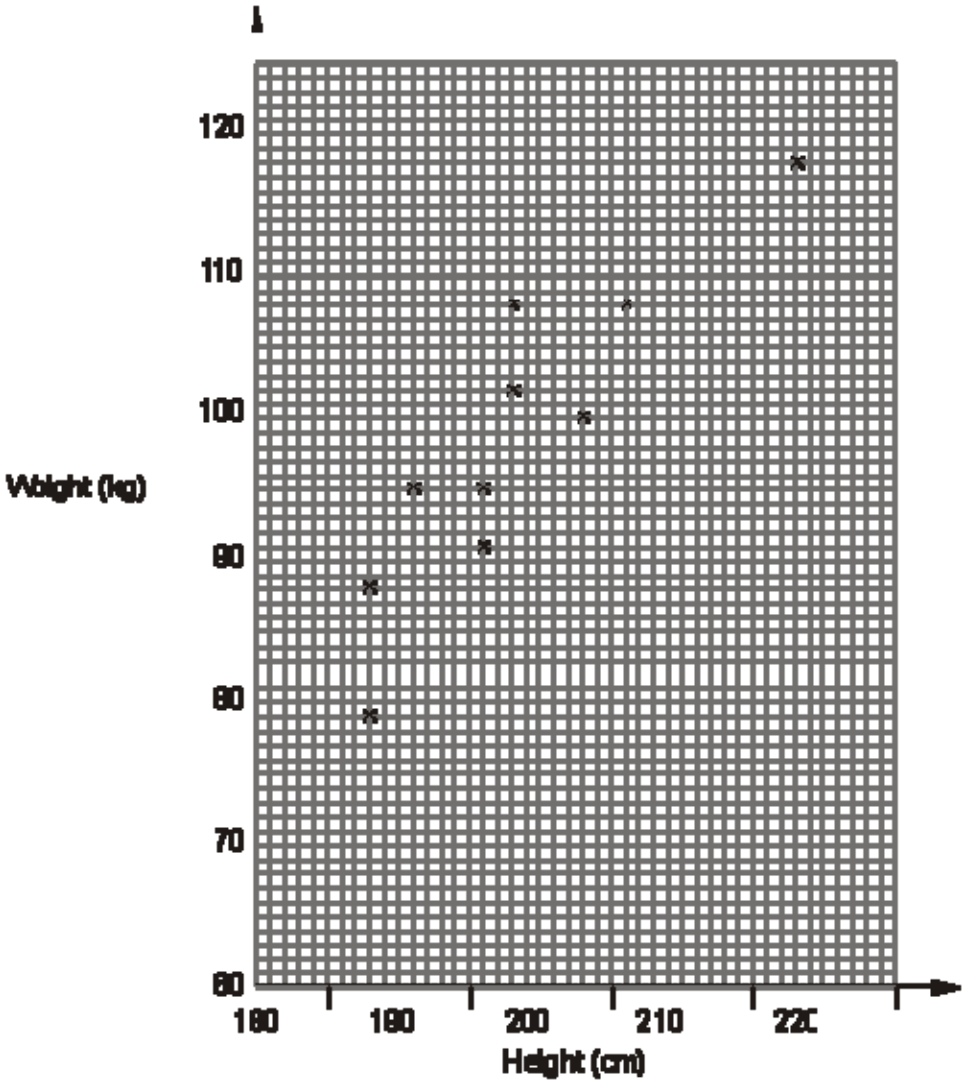
Work out the number of people who like the Telegraph best.

.....

(Total 4 marks)

Q7. The scatter graph shows some information about a random sample of ten male players at a basketball club.

For each player it shows his height and his weight.



(a) (i) On the scatter graph, draw a line of best fit.

(ii) Work out the gradient of your line of best fit.

.....

(3)

(b) Estimate the proportion of male players in the club whose weight is greater than 99 kg and whose height is less than 200 cm.

.....

(2)

(Total 5 marks)

Q8. The table shows some information about the ages, in years, of 80 people.

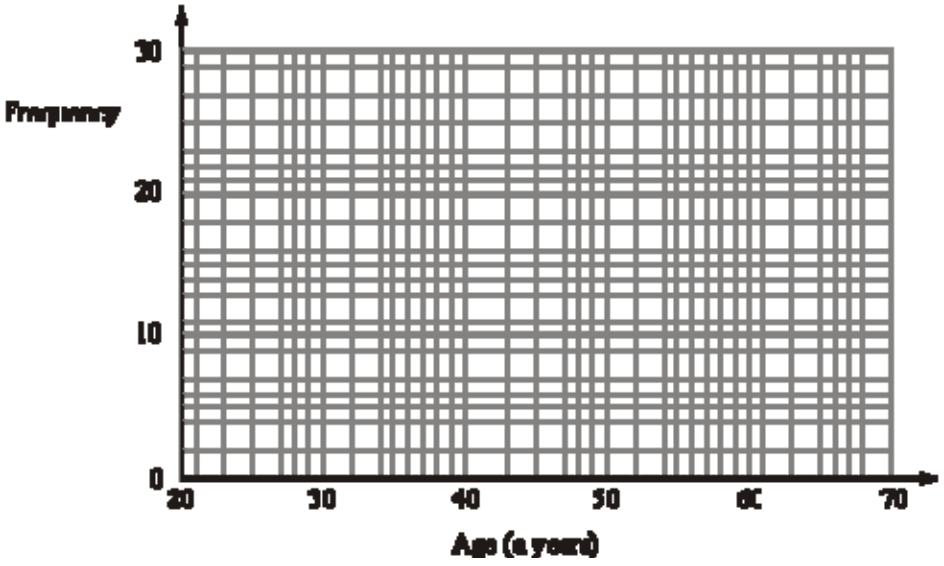
Age (a years)	Frequency
$20 \leq a < 30$	19
$30 \leq a < 40$	22
$40 \leq a < 50$	24
$50 \leq a < 60$	10
$60 \leq a < 70$	5

(a) Find the class interval that contains the median.

.....

(1)

(b) Draw a frequency polygon to show this information.



(2)

(Total 3 marks)

Q9. A teacher asked 30 students if they had a school lunch or a packed lunch or if they went home for lunch.

17 of the students were boys.
4 of the boys had a packed lunch.
7 girls had a school lunch.
3 of the 5 students who went home were boys.

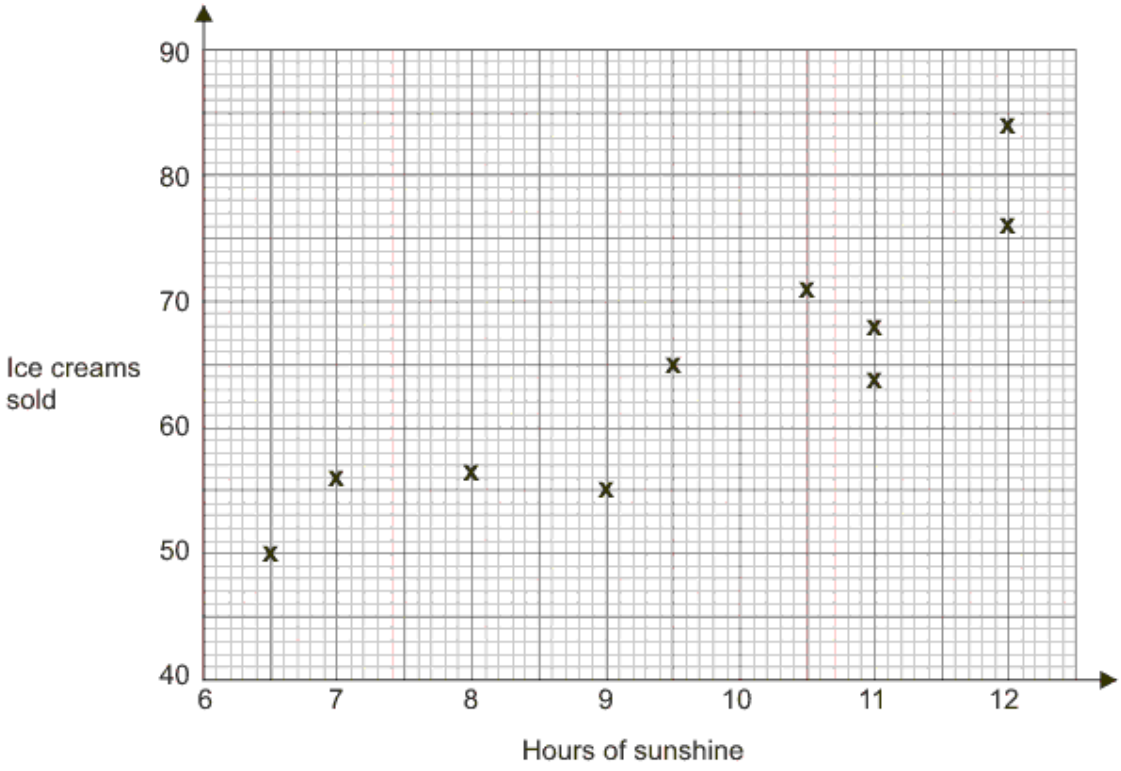
Work out the number of students who had a packed lunch.

.....

(Total 4 marks)

Q10. 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)

Q11. (a) Dan is doing a survey to find out how much time students spend playing sport. He is going to ask the first 10 boys on the register for his PE class.

This may **not** produce a good sample for Dan's survey.

Give **two** reasons why.

Reason 1

.....

.....

Reason 2

.....

.....

(2)

(b) Design a suitable question for Dan to use on a questionnaire to find out how much time students spend playing sport.

(2)
(Total 4 marks)

Q12. Ouzma wants to find out the method of transport people use to travel to a shopping centre.

Design a suitable data collection sheet she could use to collect this information.

(Total 3 marks)

Q13. The table gives information about the number of goals scored by a football team in each match last season.

Number of goals	Frequency
0	4
1	5
2	4
3	7
4	4

(a) Write down the modal number of goals scored.

..... **(1)**

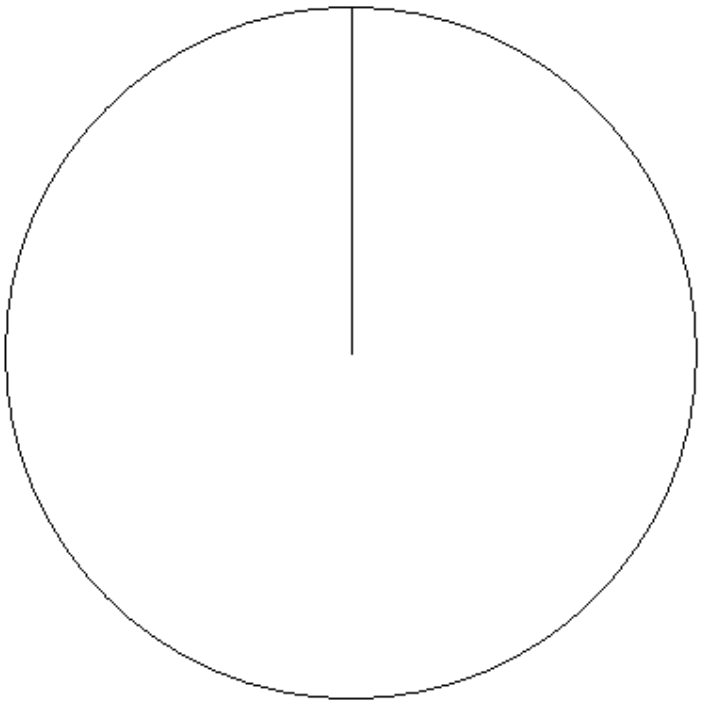
(b) Work out the total number of goals scored by the team last season.

..... **(2)**

The table below gives information about the results of the matches played by the team.

Result	Frequency
Won	10
Drew	6
Lost	8

(c) Draw an accurate pie chart to show this information.



(3)
(Total 6 marks)

Q14. 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)

Q15. Zoe recorded the heart rate of each of 15 people.
She showed her results in a stem and leaf diagram.

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

Key:
5 | 8 means 58 beats per minute

(a) Find the median heart rate.

..... beats per minute

(1)

(b) Work out the range of the heart rates.

..... beats per minute

(2)

Zoe then asked the 15 people to walk up some stairs.
Zoe recorded the heart rates again.

She used the results to work out the median and the range.

Median	78
Range	37

(c) Compare the heart rates of the people before they walked up the stairs with their heart rates after they walked up the stairs.

.....

.....

.....

(2)
(Total 5 marks)

Q16. 120 children went on a school activities day.
Some children went bowling.
Some children went to the cinema.
The rest of the children went skating.

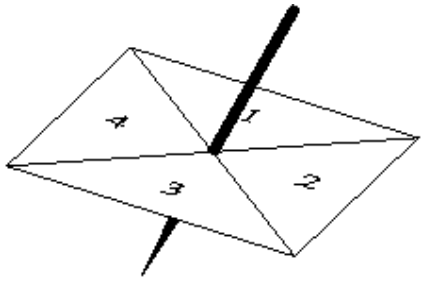
66 of these children were girls.
28 of the 66 girls went bowling.
36 children went to the cinema.
20 of the children who went to the cinema were girls.
15 boys went skating.

Work out the number of children who went bowling.

.....

(Total 4 marks)

Q17. Laura has a four-sided spinner.
The spinner is biased.



The table shows each of the probabilities that the spinner will land on 1 or land on 3
The probability that the spinner will land on 2 is equal to the probability that it will land on 4

Number	1	2	3	4
Probability	0.25		0.35	

Laura is going to spin the spinner once.

(a) Work out the probability that the spinner will **not** land on 1

..... **(2)**

(b) Work out the probability that the spinner will land on 2

..... **(2)**
(Total 4 marks)

Q18. Michael carried out a survey of some students.
He asked them the type of TV programme they liked best.

The accurate pie chart shows some of this information.

Michael chooses one of the students at random.

(a) (i) Find the probability that this student likes Soaps best.

.....

(ii) Find the probability that this student does **not** like Soaps best.

.....

(2)

6 students said they liked the News best.

(b) How many students took part in the survey?

.....

(2)

(Total 4 marks)

Q19. Zach has 10 CDs.

The table gives some information about the number of tracks on each CD.

Number of tracks	Frequency	
11	1	
12	3	
13	0	
14	2	
15	4	

(a) Write down the mode.

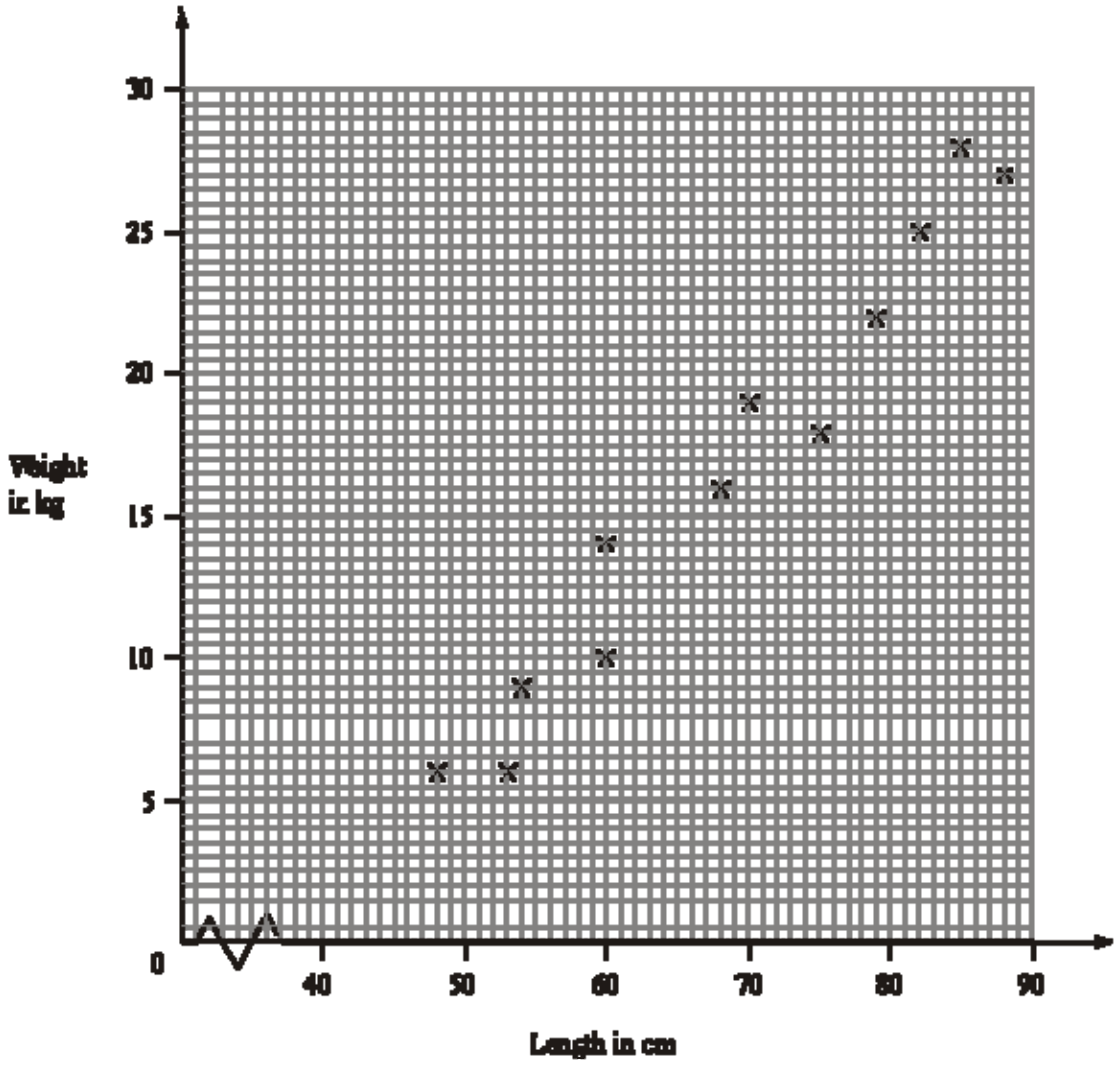
..... (1)

(b) Work out the mean.

..... (3)

(Total 4 marks)

Q20. Sanji goes fishing for pike. The scatter graph shows information about the weights and the lengths of some of the pike Sanji caught.



(a) Describe the relationship between the weight and the length of these pike.

.....
..

(1)

Sanji also caught a pike of weight 24 kg and length 78 cm.

(b) Show this information on the scatter graph.

(1)

A pike has a length of 65 cm.

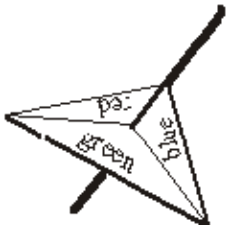
(c) Estimate the weight of this pike.

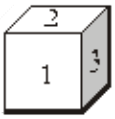
..... kg

(2)

(Total 4 marks)

Q21. The diagram shows a 3-sided spinner and an ordinary dice.





The spinner has 1 green side, 1 blue side and 1 red side.

Alex spins the spinner once and rolls the dice once.

Write down all the possible outcomes.
One has already been done for you.

(g, 1)

.....
.

.....
..

(Total 2 marks)

Q22. Zach has 10 CDs.
The table gives some information about the number of tracks on each CD.

Number of tracks	Frequency	
11	1	
12	3	
13	0	
14	2	
15	4	

Work out the mean.

.....

(Total 3 marks)

Q23. This coloured wheel spins round.
The sectors are coloured yellow, red, green and blue.

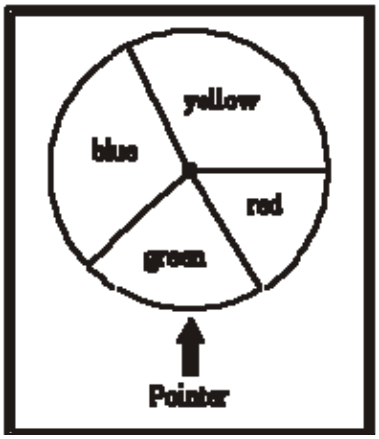


Diagram **NOT** accurately drawn

Harry spins the wheel.
When the wheel stops spinning, Harry writes down the colour shown by the pointer.

The probability that the wheel will stop at yellow or red or green is given in the table.

Colour	yellow	red	green	blue
Probability	0.35	0.1	0.3	

(a) Work out the probability that the wheel will stop at blue.

.....

(2)

(b) Work out the probability that the wheel will stop at either yellow or red.

.....

(2)

Hannah is going to spin the wheel 200 times.

(c) Work out an estimate for the number of times the wheel will stop at green.

.....

(2)
(Total 6 marks)

Q24. 80 children went on a school trip. They went to London or to York.

23 boys and 19 girls went to London.
14 boys went to York.

(a) Use this information to complete the two-way table.

	London	York	Total
Boys			
Girls			
Total			

(3)

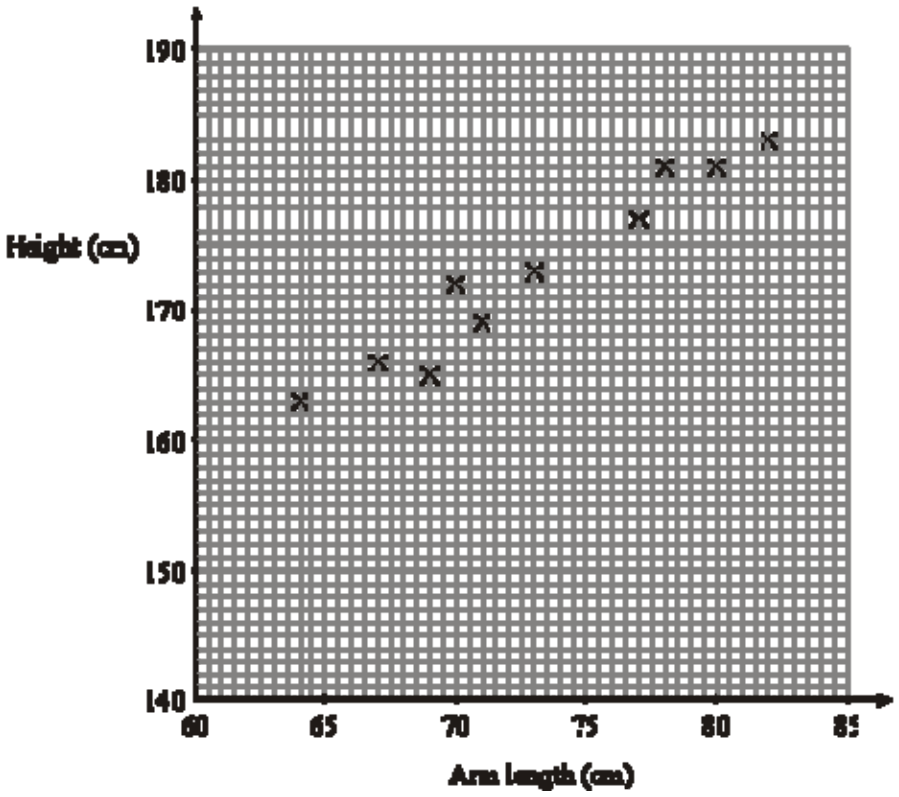
One of these 80 children is chosen at random.

(b) What is the probability that this child went to London?

.....

(1)
(Total 4 marks)

Q25. The scatter graph shows some information about 10 students.
It shows the arm length and the height of each student.



(a) What type of correlation does this scatter graph show?

.....

(1)

(b) Draw a line of best fit on the scatter graph.

(1)

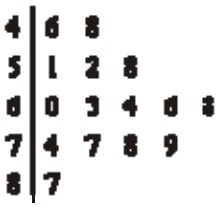
Another student has an arm length of 75 cm.

(c) Use your line of best fit to estimate the height of this student.

..... cm (1)

(Total 3 marks)

Q26. Zoe recorded the weight of each of 15 people.
She showed her results in a stem and leaf diagram.



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

(a) Write down the number of people with a weight of more than 70 kg.

.....

(1)

(b) Work out the range of the weights.

..... kg

(2)

(Total 3 marks)

Q27. James wants to find out how many text messages people send.

He uses this question on a questionnaire.

"How many text messages do you send?"

☐ 1 to 10 ☐ 11 to 20 ☐ 21 to 30 ☐ more than 30

(a) Write down **two** things wrong with this question.

1 .....

2 .....

(2)

James asks 10 students in his class to complete his questionnaire.

(b) Give **one** reason why this may not be a suitable sample.

.....

.....

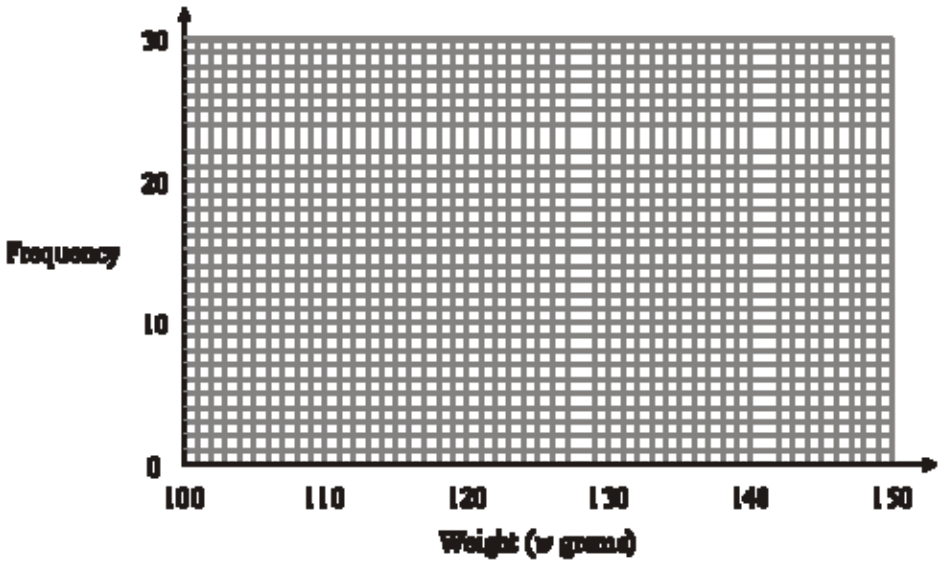
(1)

(Total 3 marks)

Q28. The table shows some information about the weights (w grams) of 60 apples.

Weight (w grams)	Frequency
$100 \leq w < 110$	5
$110 \leq w < 120$	9
$120 \leq w < 130$	14
$130 \leq w < 140$	24
$140 \leq w < 150$	8

Draw a frequency polygon to show this information.



(Total 2 marks)

Q29. Zoe recorded the weights, in kilograms, of 15 people. Here are her results.

87 51 46 77 74 58 68 78
48 63 52 64 79 60 66

Complete the ordered stem and leaf diagram to show these results.

4	
5	
6	
7	
8	

Key:

(Total 3 marks)

Q30. A bag contains only red, green and blue counters. The table shows the probability that a counter chosen at random from the bag will be red or will be green.

Colour	Red	Green	Blue
Probability	0.5	0.3	

Mary takes a counter at random from the bag.

(a) Work out the probability that Mary takes a blue counter.

..... **(2)**

The bag contains 50 counters.

(b) Work out how many green counters there are in the bag.

..... **(2)**

(Total 4 marks)

Q31. Josh asked 30 adults how many cups of coffee they each drank yesterday.

The table shows his results.

Number of cups	**Frequency**	
0	5	
1	9	
2	7	
3	4	
4	3	
5	2	

Work out the mean. .....

(Total 3 marks)

Q32. A factory makes three sizes of bookcase. The sizes are small, medium and large.

Each bookcase can be made from pine or oak or yew. The two-way table shows some information about the number of bookcases the factory makes in one week.

	Small	Medium	Large	Total
Pine	7			23
Oak		16		34
Yew	3	8	2	13
Total	20		14	

Complete the two-way table.

(Total 3 marks)

Q34. Poppy wants to find out for how much time people use their computer.

She uses this question on a questionnaire.

For how much time do you use your computer?

0–1 hours	☐	3–4 hours	☐
1–2 hours	☐	4–5 hours	☐
2–3 hours	☐	5–6 hours	☐

Write down **two** things that are wrong with this question.

1 .....

.....

.....

2 .....

.....

(Total 2 marks)

Q35. A bag contains counters which are blue or red or green or yellow.
Mark takes a counter at random from the bag.

The table shows the probabilities he takes a blue or a red or a yellow counter.

Colour	blue	red	green	yellow
Probability	0.3	0.2		0.1

(a) Work out the probability that Mark takes a green counter.

..... (2)

Mark puts the counter back into the bag.

Laura takes a counter at random from the bag.
She looks at its colour then puts the counter back into the bag. She does this 50 times.

(b) Work out an estimate for the number of times Laura takes a red counter.

.....

(2)

(Total 4 marks)

Q36. Poppy wants to find out for how much time people use their computer.

She uses this question on a questionnaire.

For how much time do you use your computer?

0–1 hours	☐	3–4 hours	☐
1–2 hours	☐	4–5 hours	☐
2–3 hours	☐	5–6 hours	☐

(a) Write down **two** things that are wrong with this question.

1 .....

.....

2 .....

.....

(2)

Poppy gives her questionnaire to all the students in her class.

Her sample is biased.

(b) Give **one** reason why.

.....

.....

(1)

(Total 3 marks)

Q37. Josh asked 30 students how many minutes they each took to get to school.
The table shows some information about his results.

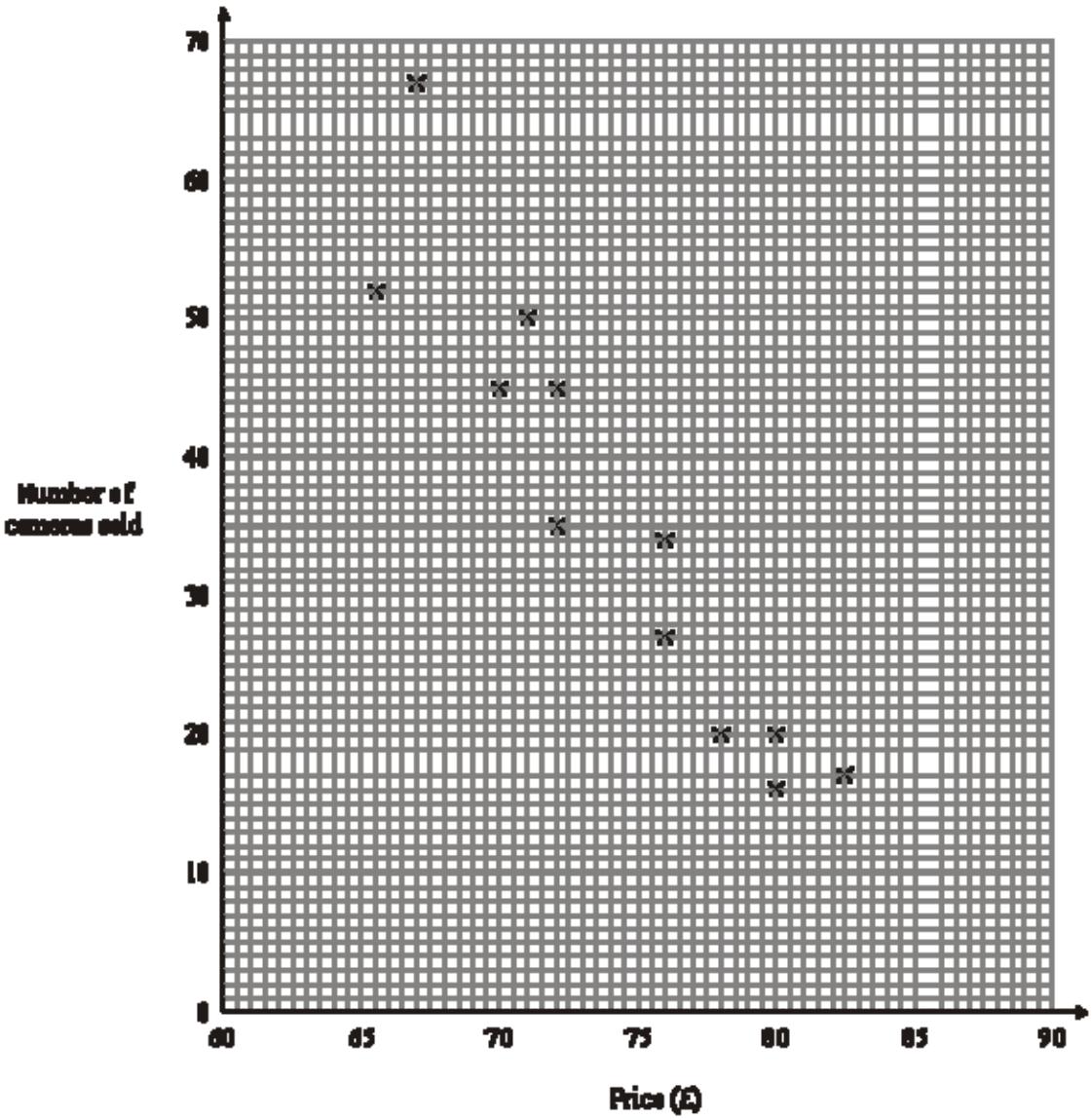
Time taken (*t* minutes)	**Frequency**		
$0 < t \leq 10$	6		
$10 < t \leq 20$	11		
$20 < t \leq 30$	8		
$30 < t \leq 40$	5		

Work out an estimate for the mean number of minutes taken by the 30 students.

..... minutes

(Total 4 marks)

Q38. A superstore sells the Clicapic digital camera. The price of the camera changes each week. Each week the manager records the price of the camera and the number of cameras sold that week. The scatter graph shows this information.



The table shows the prices and the numbers of Clicapic cameras sold during another 4 weeks.

Price (£)	67	70	75	80
Number of cameras sold	50	50	40	25

(a) On the scatter graph, plot the information from the table.

(2)

(b) Describe the relationship between the price of the camera and the number of cameras sold.

..... **(1)**

..

(c) Draw a line of best fit on the scatter graph.

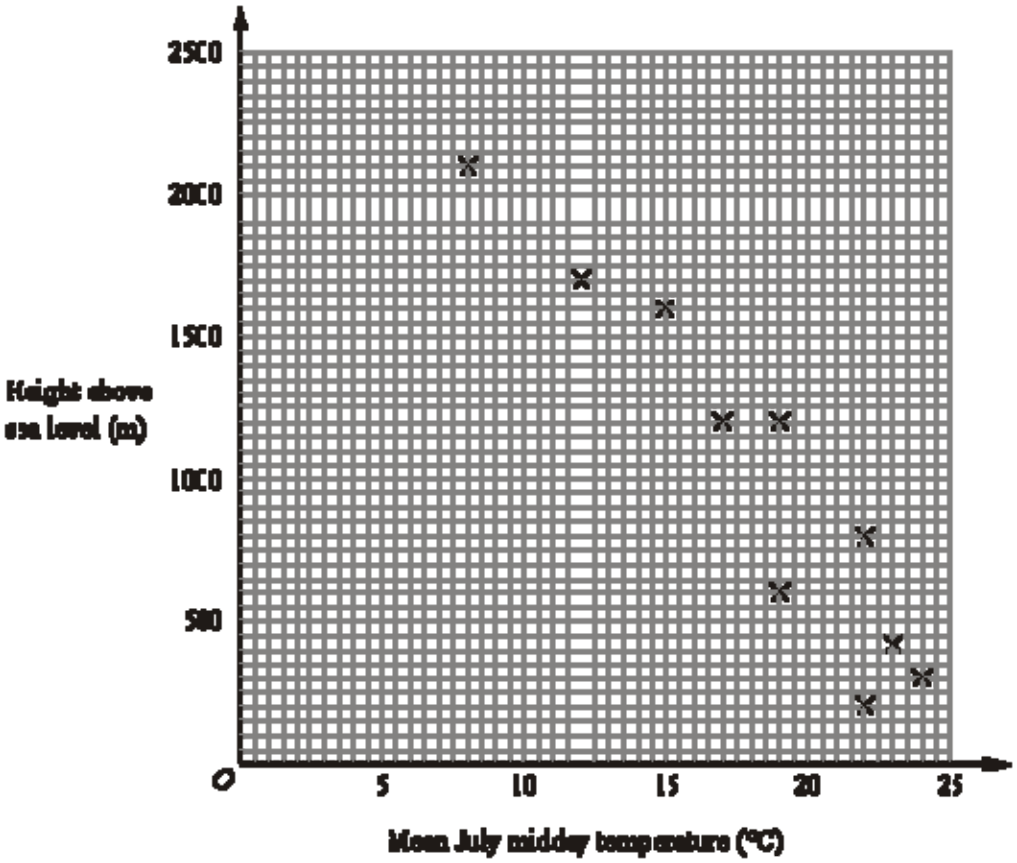
(1)

(d) Use your line of best fit to estimate how many cameras are sold in a week when the price is £74.

..... **(1)**

(Total 5 marks)

Q39. The scatter graph shows information for some weather stations.
It shows the height of each weather station above sea level (m) and the mean July midday temperature (°C) for that weather station.



The table shows this information for two more weather stations.

Height of weather station above sea level (m)	1000	500
Mean July midday temperature (°C)	20	22

(a) Plot this information on the scatter graph.

(1)

(b) What type of correlation does this scatter graph show?

.....

(1)

(c) Draw a line of best fit on the scatter graph.

(1)

A weather station is 1800 metres above sea level.

(d) Estimate the mean July midday temperature for this weather station.

..... °C (1)

At another weather station the mean July midday temperature is 18°C.

(e) Estimate the height above sea level of this weather station.

..... m (1)

(Total 5 marks)

Q40. There are 3 red pens, 4 blue pens and 5 black pens in a box.
Sameena takes a pen, at random, from the box.

(a) Write down the probability that she takes a black pen.

..... (2)

(b) Write down the probability that Sameena takes a pen that is **not** black.

..... (1)

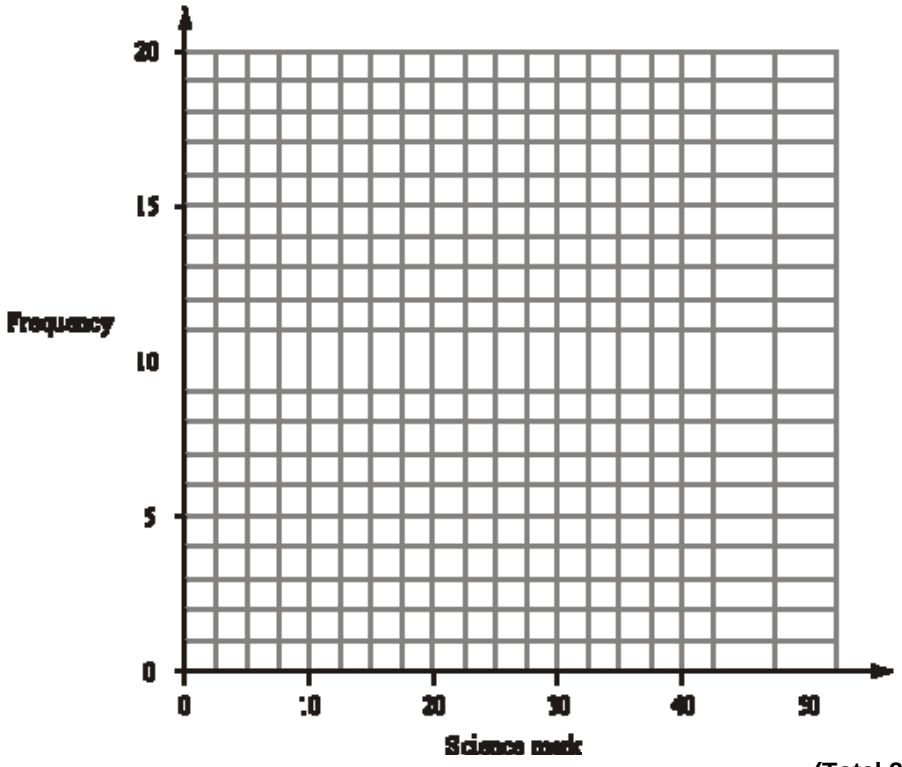
(Total 3 marks)

Q41. 60 students take a science test. The test is marked out of 50.

This table shows information about the students' marks.

Science mark	0–10	11–20	21–30	31–40	41–50
Frequency	4	13	17	19	7

On the grid, draw a frequency polygon to show this information.



(Total 2 marks)

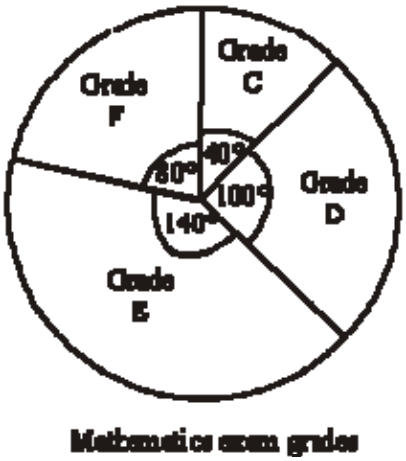
Q42. There are 3 red pens, 4 blue pens and 5 black pens in a box.
Sameena takes a pen, at random, from the box.

Write down the probability that she takes a black pen.

.....

(Total 2 marks)

Q43. 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?

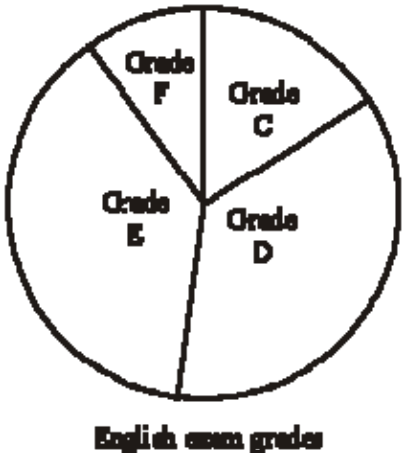
.....

(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.



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

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

.....

.....

(1)

(Total 6 marks)

Q44. Majid carried out a survey of the number of school dinners 32 students had in one week.

The table shows this information.

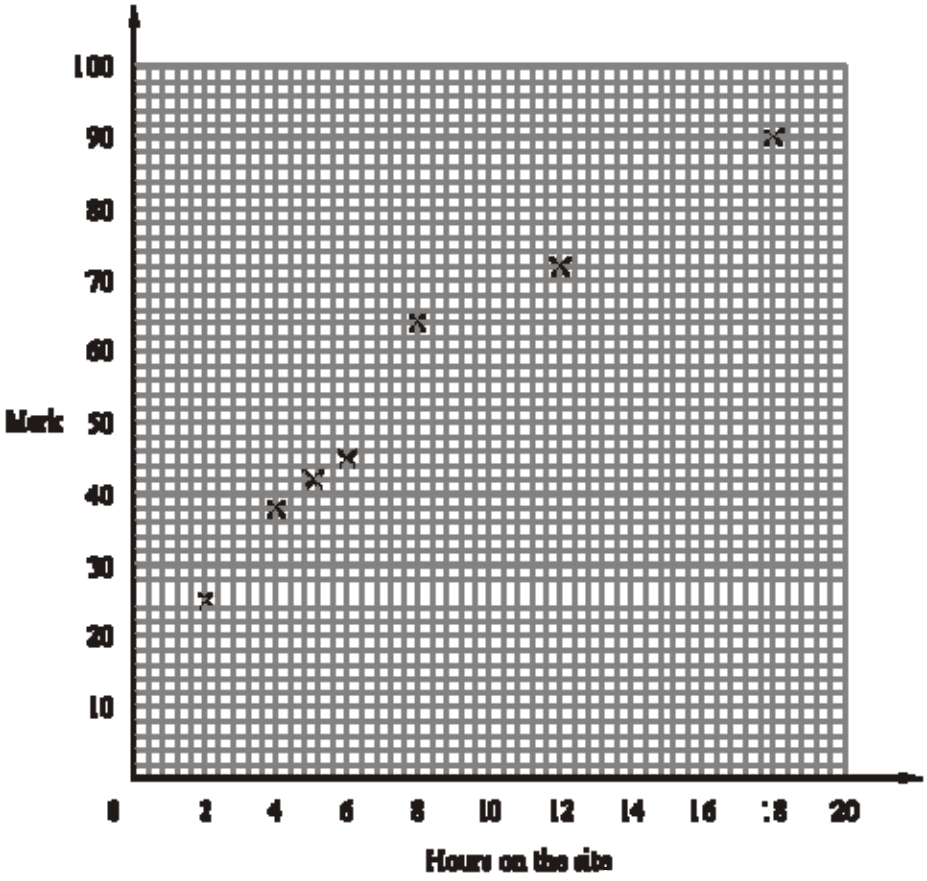
Number of school dinners	Frequency	
0	0	
1	8	
2	12	
3	6	
4	4	
5	2	

Calculate the mean.

.....

(Total 3 marks)

Q45. Some students revised for a mathematics exam. They used an internet revision site. The scatter graph shows the times seven students spent on the internet revision site and the marks the students got in the mathematics exam.



Here is the information for 3 more students.

Hours on the site	7	10	16
Mark	50	56	78

(a) Plot this information on the scatter graph.

(1)

(b) What type of correlation does this scatter graph show?

.....

(1)

(c) Draw a line of best fit on the scatter graph.

(1)

A student spent 11 hours on the internet revision site.

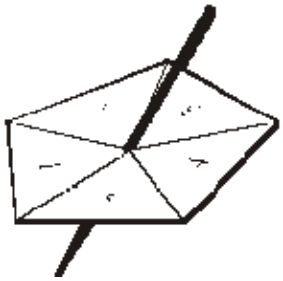
(d) Use the line of best fit to estimate this student's mathematics exam mark.

.....

(1)

(Total 4 marks)

Q46. Here is a 5-sided spinner.



The sides of the spinner are labelled 1, 2, 3, 4 and 5
The spinner is biased.
The probability that the spinner will land on each of the numbers 1, 2, 3 and 4 is given in the table.

Number	1	2	3	4	5
Probability	0.15	0.05	0.2	0.25	x

Work out the value of x.

x = ...

(Total 2 marks)

Q47. Jason collected some information about the heights of 19 plants.

This information is shown in the stem and leaf diagram.

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

Key: 4|8 means 43 mm

Find the median.

..... mm

(Total 2 marks)

Q48. Sethina recorded the times, in minutes, taken to repair 80 car tyres.
Information about these times is shown in the table.

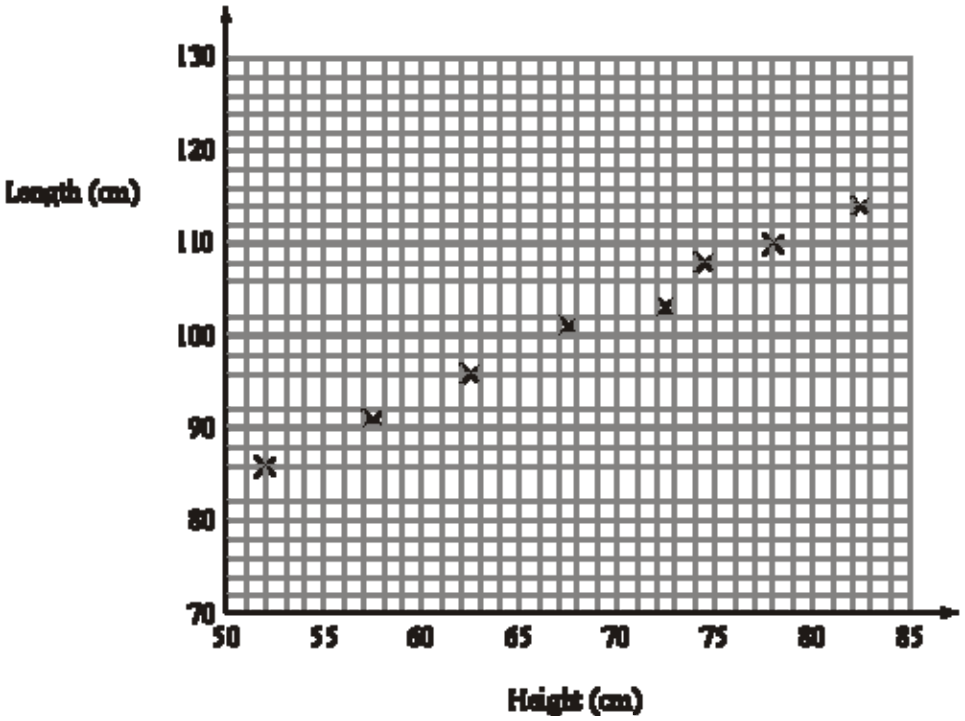
Time (t minutes)	**Frequency**		
$0 < t \leq 6$	15		
$6 < t \leq 12$	25		
$12 < t \leq 18$	20		
$18 < t \leq 24$	12		
$24 < t \leq 30$	8		

Calculate an estimate for the mean time taken to repair each car tyre.

..... minutes

(Total 4 marks)

Q49. The scatter graph shows information about eight sheep.
It shows the height and the length of each sheep.



The table gives the height and the length of two more sheep.

Height (cm)	65	80
Length (cm)	100	110

(a) On the scatter graph, plot the information from the table.

(1)

(b) Describe the relationship between the height and the length of these sheep.

.....

(1)

The height of a sheep is 76 cm.

(c) Estimate the length of this sheep.

.....cm

(2)

(Total 4 marks)

Q50. The table shows information about the number of hours that 120 children used a computer last week.

Number of hours	Frequency
$0 < h \leq 2$	10
$2 < h \leq 4$	15
$4 < h \leq 6$	30
$6 < h \leq 8$	35
$8 < h \leq 10$	25
$10 < h \leq 12$	5

Work out an estimate for the mean number of hours that the children used a computer.
Give your answer to 2 decimal places.

..... cm

(Total 4 marks)

M1.

	Working	Answer	Mark	Additional Guidance
(a)	$\frac{91-86}{86} \times 100 = \frac{0}{86} \times 100 =$ 7.05882..	7.06%	3	**M2** $\frac{91-86}{86}$ × 100 (**M1** $\frac{91-86}{86}$ or sight of $\frac{0}{86}$ or 0.0705 – 0.071 or or 1.0705 – 1.071) **A1** 7.05 – 7.06 Or **M1** $\frac{91}{86}$ × 100 (= 107.05) **M1** (dep) "107.05" – 100 **A1** 7.05-7.06 T&I methods must lead to an answer 7.05 – 7.06 for full marks, otherwise 0 marks
(b)	(64 + 73 + 85)/3 = 222/3 = 74 (73 + 85 + 91)/3 = 249/3 = 83	74, 83	2	**M1** for (64 + 73 + 85)/3 or (73 + 85 + 91)/3 or 222/3 or 249/3 or 74 or 83 (condone missing brackets) **A1** both answers in the correct order cao
				Total for Question: 5 marks

M2.

	Working	Answer	Mark	Additional Guidance
QWC (i, ii, iii) **FE**	2(215) + 3(128) = 814 2(211) + 3(134) = 824 2(223) + 3(119) = 803	Easy Plane £803	6	**M1** for 2 × Adult + 3 × Child **M1** for using correct Adult and Child, i.e. (215, 128) or (211, 134) or (223, 119) **A2** for 814, 824 and 803 (A1 for one or two correct or for a correct 2×'Adult' + 3×'Child') **B1** for correct units, i.e. £ or pounds **C1** for Easy Plane identified **QWC: Decision must be stated and total costs must be attributable**
				Total for Question: 6 marks

M3.

	Working	Answer	Mark	Additional Guidance
(a)	3 × 6	18	2	**M1** for 360 ÷ 60 or 6 seen or 1 gold = 20 **A1** cao
(b)		No and appropriate explanation	1	**C1** for 'No' and correct explanation, e.g. the pie charts only show that the proportions are the same **OR** explains that she could be correct if the total number of medals is the same in each year **OR** explains that we don't know if she is correct because the total number of medals in 2004 is not known.

	Total for Question: 3 marks

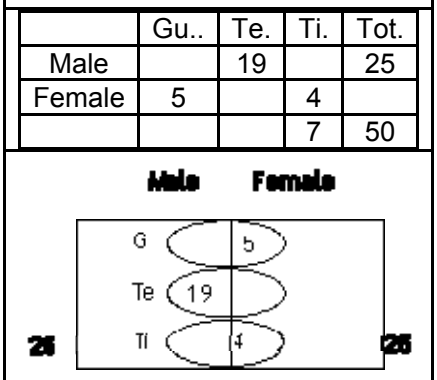
M4.

	Working	Answer	Mark	Additional Guidance
QWC	12, 20, 7, 28, 28, 35, 37 15, 18, 25, 27, 29, 31, 35, 35, 40	Compares 1.medians/ means 2.ranges	6	**B2** for median (boys) = 28 and median (girls)= 29 OR mean (boys) = 26.7 or better and mean (girls) = 28.3 or better (B1 for one correct median/mean) B2 for range (boys) = 25 and range (girls) = 25 (B1 for one correct range) **OR** **B2** for fully correct diagram/chart to compare, e.g. back-to-back stem and leaf diagram, dual bar chart, vertical (stick) graphs, etc (B1 for diagram chart with one error in presentation) **C1** for median (girls) > median (boys) oe **or** mean (girls) > mean (boys) oe **or** for range (boys) = range (girls) oe **C1** for comments relating to all working (ie range/mean/median/charts dep on B4) **QWC: Decisions should be justified, and calculations attributable** SC If no marks scored B1 for a correct comparison
				Total for Question: 6 marks

M5.

	Working	Answer	Mark	Additional Guidance
(a)		Question + response boxes	2	**B2** for a suitable question with at least 3 non-overlapping response boxes (must include a time period) (B1 for a suitable question with time period or non-overlapping response boxes)
(b)		Reason	1	**B1** for biased or all the students the same age or students (may) eat more sweets, etc
				Total for Question: 3 marks

M6.

Working	Answer	Mark	Additional Guidance
e.g.  	35	4	**M1** for a two-way table or Venn diagram. Telegraph, Times, Guardian and male, female labelled **A1** for 4, 5, 7, 19 and 25 **M1** for attempt to find 16 (condone one error) **A1** cao [NB Two-way table/Venn diagram need not contain all numbers]
			Total for Question: 4 marks

	Gu..	Te.	Ti.	Tot.
Male		19		25
Female	5		4	
			7	50

M7.

	Working	Answer	Mark	Additional Guidance
(a)		Line of best fit 1.25	3	**B1** for line drawn between (190, 80), (190, 95) and (210, 105), (210, 120) **M1** for diff. *y* / diff. *x* **A1** for 0.5 — 2 or ft their line of best fit
(b)		20%	2	**M1** for a horizontal line at 99 and a vertical line at 200 or 2 seen **A1** for 20% or 2/10 or 0.2 oe
				Total for Question: 5 marks

M8.

	Working	Answer	Mark	Additional Guidance
(a)		$30 \leq a < 40$	1	**B1** cao
(b)		Points plotted at (25, 16), (35, 20), (45, 23), (55, 9), (65, 2) and joined with line segments	2	**B2** complete polygon (ignore histograms and any lines below an age of 25 or above an age of 65), but award B1 only if there is a line joining the first to the last point (B1 one vertical or horizontal plotting error orincorrect but consistent error in placing the midpoints horizontally orcorrect plotting but not joined) Plotting tolerance: 1 (2 mm) square; points to be joined by lines (ruled or hand drawn, but not curves)
				Total for Question: 3 marks

M9.

<table>
<tr><th>Working</th><th>Answer</th><th>Mark</th><th>Additional Guidance</th></tr>
<tr><td>30 – 17 = 13
5 – 3 = 2
13 – 2 – 7 = 4
4 + 4

OR
17 – 4 – 3 = 10
10 + 7 = 17
30 – 5 – 17

OR
17 – 4 = 13
13 + 7 = 20
20 + (5 – 3) = 22
30 – 22
<table><tr><td></td><td>B</td><td>G</td><td>Total</td></tr><tr><td>Packed</td><td>4</td><td></td><td></td></tr><tr><td>School lunch</td><td></td><td>7</td><td></td></tr><tr><td>Home</td><td>3</td><td></td><td>5</td></tr><tr><td>Total</td><td>17</td><td></td><td>30</td></tr></table></td><td>8</td><td>4</td><td>M1 for calculation of total girls 30 – 17 (= 13)
M1 for calculation of girls going home 5 – 3
(= 2)
M1 for calculation of girls having packed lunch "13" – "2" – 7 (= 4)

M1 for 17 – 4 – 3 (= 10)
M1 for “10”+ 7 (= 17)
M1 for 30 – 5 – “17”

M1 for 17 – 4 + 7 (= 20)
M1 for “20” + (5 – 3)
M1 for 30 – “22”

A1 cao

[Interim answers may appear in a 2-way table or Venn diagram]
M1 for a 2-way table or diagram, with clear labeling, showing at least 3 pieces of the given information correctly placed
A1 for 13 (girls) or 10 (boys, school lunch)
A1 for 2 (girls, home) or 17 (total school lunch)
A1 cao
[Note: for the award of the final A1, the 8 in any diagram must be highlighted, in some way, to be the required answer]</td></tr>
<tr><td colspan="4">Total for Question: 4 marks</td></tr>
</table>

M10.

	Answer	Mark	Additional Guidance
(a)	Point at (11.5, 73)	1	**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			

M11.

	Answer	Mark	Additional Guidance
(a)	Reason	2	**B2** for 2 acceptable reasons relating to the types below [**B1** for 1 acceptable reason] Bias relating to age. Bias relating to gender Bias relating to PE students Size of sample too small Sampling method is not random
(b)	Question and response boxes	2	B2 for a suitable question with at least 3 non-overlapping response boxes (must include a time period and units) [**B1** for a suitable question with time period or at least 3 non-overlapping response boxes with units]
			Total for Question: 4 marks

M12.

Answer	Mark	Additional Guidance
Types Tally Frequency	3	**B3** for correct table with all three aspects Aspect 1:'method of travel' or for at least 3 of bus, car, walk, other etc. Aspect 2: 'tally' or tally marks or 'frequency' or 'number of people' Aspect 3: 'frequency' or frequencies or 'total' or totals or 'number of people' **B2** for two aspects **B1** for one aspect
		Total for Question: 3 marks

M13.

	Working	Answer	Mark	Additional Guidance
(a)		3	1	**B1** cao
(b)	0 × 4 + 1 × 5 + 2 × 4 + 3 × 7 + 4 × 4 = 50	50	2	**M1** for fx calculated (could be implied by at least 2 correct) **A1** cao
(c)	360° ÷ 24 = 15 Sector angles: W=150; D=90; L=120	Angles drawn, labelled	3	**M1** for 360 ÷ 24 or 15 seen or one angle correct in pie chart (±2°), ignore all labels, or one correct angle in the table **A1** for any two angles correct in pie chart. Ignore labels **A1** for fully correct and labelled pie chart All angles ±2°
				Total for Question: 6 marks

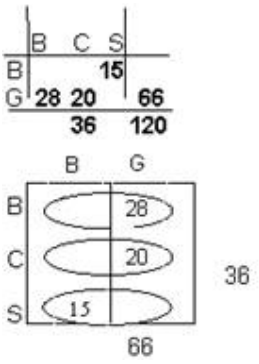
M14.

Working	Answer	Mark	Additional Guidance
714 × 2 = 1428 714 × 0.95 = 678.30 678.30 × 2 = 1356.60 1428 + 1356.60 = 2784.60 802 × 2 = 1604 802 × 0.85 = 681.70 681.70 × 2 = 1363.40 1604 + 1363.40 = 2967.40	Comparison	5	**B1** for identifying 714 and 802 **M1** for $\frac{95}{100} \times '714'$ oe or $\frac{85}{100} \times '802'$ oe **M1** for 2 × 'adult' + 2 × 'child' oe for at least one holiday **A1** for 2784.6(0) and 2967.4(0) or 2785 and 2967 **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.)
			Total for Question: 5 marks

M15.

	Working	Answer	Mark	Additional Guidance
(a)		67	1	**B1** cao
(b)	84 – 58 = 26	26	2	**M1** for 84 – 58, accept 58 to 84 and 58 – 84 **A1** cao
(c)		Two comparisons	2	Ft **B1** for heart rates faster after walking , bigger median, median increase by 11 Ft **B1** for heart rates more spread out after walking, bigger range, range increases by 11 Statements must be entirely true and not contradictory
				Total for Question: 5 marks

M16.

Working	Answer	Mark	Additional Guidance
	51	4	**M1** for a two-way table or Venn diagram with bowling, cinema, skating, boys and girls labelled or a list of at least two combinations clearly labelled. **M1** for attempt to find an unknown eg 66 − 28 − 20, 120 − 66, 36 − 20 **A1** for 16 or 18 or 54 or 23 or 33 **A1** cao (Note: 36 + 15 = 51 scores no marks)
			Total for Question: 4 marks

M17.

	Working	Answer	Mark	Additional Guidance
(a)	1 – 0.25	0.75	2	**M1** for 1 – 0.25 or 0.2 + 0.2 + 0.35 **A1** for 0.75 oe
(b)	(1 – 0.25 – 0.35) ÷ 2	0.2	2	**M1** for (1 – 0.25 – 0.35) ÷ 2 **A1** for 0.2 oe
				Total for Question: 4 marks

M18.

	Working	Answer	Mark	Additional Guidance
(a)(i)		$\frac{90}{300}$ oe	1	**B1** for $\frac{90}{300}$ oe (accept 25% or 0.25 or ¼) Condone any incorrect cancelling if correct answer is seen Do not accept 1:4 or 4:1 or 1 out of 4 or 3 in 4 etc
(ii)		$\frac{270}{360}$ oe	1	**B1** for $\frac{270}{360}$ oe (accept 75% or 0.75 or ¾) Condone any incorrect cancelling if correct answer is seen Do not accept 3:4 or 4:3 or 3 out of 4 or 3 in 4 etc SC: **B1** for 1 – (a)(i) SC: **B0** in (i) and **B1** in (ii) for correct answers but consistent writing of probabilities incorrectly in **BOTH** parts (a)(i) **and** (a)(ii) e.g. 1 out of 4 **and** 3 out of 4
(b)	(360 ÷ 30) × 6	72	2	**M1** for 360 ÷ 30 o.e. e.g.30º is a twelfth or 6 ÷ 30 or 30 ÷ 6 or 1 person is 5º o.e. or sight of 12 × 6 or 360 ÷ 5 or attempt add 5 frequencies 3 of which are correct or any partial equivalent method **A1** cao
				Total for Question: 4 marks

M19.

	Working	Answer	Mark	Additional Guidance
(a)		15	1	**B1** cao
(b)	(1 × 11 + 3 × 12 + 0 × 13 + 2 × 14 + 4 × 15) ÷ 10 = 135 ÷ 10 = 11 + 36 + 0 + 28 + 60	13.5	3	**M1** for 1 × 11 or 3 × 12 or 0 × 13 or 2 × 14 or 4 × 15 or sight of any two or more of the correct answers 11, 36 , 0, 28, 60 (must be from a product however) **M1** (dep) for adding 4 or 5 of these products and dividing by 10 **A1** cao [SC: **B2** available for using '13 × 0 = 13' without further mistakes] giving an answer of 14.8
				Total for Question: 4 marks

M20.

	Answer	Mark	Additional Guidance
(a)	Positive correlation,or the heavier the pike the longer it is.	1	**B1** for positive correlation, or the heavier the pike the longer it is. (or equivalent) B0 for positive (relationship)
(b)	Point plotted correctly	1	**B1** for a correct plot ±1 square
(c)	12-17 kg	2	**B2** for an answer in the range 12 to 17 kg inclusive **OR** **M1** for drawing a line of best fit or vertical line from 65 cm **A1** for an answer in the range 12 to 17 kg or ft from "line of best fit"
			Total for Question: 4 marks

M21.

Answer	Mark	Additional Guidance
(g, 1) (g, 2) (g, 3) (g, 4) (g, 5)(g, 6) (b, 1) (b, 2) (b, 3) (b, 4)(b, 5)(b, 6) (r, 1) (r, 2) (r, 3)(r, 4) (r, 5) (r, 6)	2	**B2** for a fully correct list [**B1** for at least 6 correct additional outcomes] Ignore duplicates e.g. (g, 1) (1, g)
		Total for Question: 2 marks

M22.

Working	Answer	Mark	Additional Guidance
(1 × 11 + 3 × 12 + 0 × 13 + 2 × 14 + 4 × 15) ÷ 10 = 135 ÷ 10 = 11 + 36 + 0 + 28 + 60	13.5	3	**M1** for 1 × 11 or 3 × 12 or 0 × 13 or 2 × 14 or 4 × 15 or sight of any two or more of the correct answers 11, 36 , 0, 28, 60 (must be from a product however) **M1** (dep) for adding 4 or 5 of these products and dividing by 10 **A1** cao [SC: **B2** available for using '13 × 0 = 13' without further mistakes] giving an answer of 14.8
			Total for Question: 3 marks

M23.

	Working	Answer	Mark	Additional Guidance
(a)	1 – (0.35 + 0.1 + 0.3)	0.25	2	**M1** for 1 – (0.35 + 0.1 + 0.3) oe **A1** for 0.25 oe (accept 25%) Note: Look for answer in the table if it's not on answer line [SC: **B1** for 1 – 0.39 = 0.61, if **M0** scored; 0.61 with no working gets no marks]
(b)	0.35 + 0.1	0.45	2	**M1** for 0.35 + 0.1 oe **A1** for 0.45 oe [SC:**B1** for an answer of 0.36 or for 0.45 seen in working followed by subtraction from 1]
(c)	0.3 × 200	60	2	**M1** for 0.3 × 200 **A1** cao SC: **B2** for 60 out of 200 SC: **B1** for 60 in 200 or 60/200 or 0.3 × 200/4
				Total for Question: 6 marks

M24.

	Answer	Mark	Additional Guidance
(a)	**23** **14** 37 **19** 24 43 42 38 **80**	3	**B3** for all correct (**B2** for 5, 6, 7 or 8 correct) (**B1** for any 2 of the 4 given correctly placed)
(b)	$\frac{42}{80}$	1	**B1** for $\frac{"42"}{"80"}$ oe
			Total for Question: 4 marks

M25.

	Answer	Mark	Additional Guidance
(a)	Positive	1	**B1** cao (Accept +ve)
(b)	Line of best fit	1	**B1** for a straight line passing between (65, 160) and (65, 166) and between (80, 178) and (80, 184)
(c)	173 – 176	1	**B1** for 173 – 176 or ft from a single line segment with positive gradient ± 1 full (2mm) square
			Total for Question: 3 marks

M26.

	Working	Answer	Mark	Additional Guidance
(a)		5	1	**B1** cao
(b)	87 – 46	41	2	**M1** for 87 – 46, (accept 46 to 87 and 46 – 87) **A1** cao
				Total for Question: 3 marks

M27.

	Answer	Mark	Additional Guidance
(a)	No time period No response box for 0 Need smaller class intervals	2	**B2** for 2 of the 3 reasons (**B1** for 1 reason)
(b)	Comment on sample	1	**B1** for sample too small or all same age group or same gender
			Total for Question: 3 marks

M28.

Answer	Mark	Additional Guidance
Points plotted at (105,5), (115,9), (125,14), (135,24), (145,8) and joined with line segments	2	**B2** cao for plotting correct points ± 1 sq and joining with line segments (**B1** for points plotted correctly at midpoints of intervals or joining points with line segments at the correct heights and consistent within the class interval (including end values) or correct frequency polygon with one point incorrect) or correct frequency polygon with first and last point joined NB Ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted
		Total for Question: 2 marks

M29.

Answer	Mark	Additional Guidance
4 | 6 8 5 | 1 2 8 6 | 0 3 4 6 8 7 | 4 7 8 9 8 | 7	3	**M1** for unordered leaves (condone two errors or omissions) **A1** for a fully correct ordered stem and leaf diagram **B1** for key, eg 4 | 6 means 46
		Total for Question: 3 marks

M30.

	Working	Answer	Mark	Additional Guidance
(a)		0.2	2	**M1** for 1 – (0.5 + 0.3) **A1** for 0.2 oe **SC** Award **M1A0** for an answer of 0.92
(b)	0.3 × 50	15	2	**M1** for 0.3 × 50 oe **A1**cao **SC** Award **B1** for $\frac{16}{60}$ on the answer line if **M0** scored 50
				Total for Question: 4 marks

M31.

Working	Answer	Mark	Additional Guidance
(0 × 5) + (1 × 9) + (2 × 7) + (3 × 4) + (4 × 3) + (5 × 2) 0 + 9 +14 +12 + 12 + 10 57 ÷ 30	1.9	3	**M1** for 0 × 5, 1 × 9, etc (min 3 attempts shown) may be implied by 0, 9 etc **M1** (dep) for attempt to add and divide by 30 **A1** cao (**B2** sc for 2.06 – 2.1)
			Total for Question: 3 marks

M32.

Answer	Mark	Additional Guidance
7 **12** **4** 23 **10** 16 **8** 34 3 8 2 13 20 **36** 14 **70**	3	**B3** for fully correct table (**B2** for 4 or 5 correct entries, **B1** for 2 or 3 correct entries)
		Total for Question: 3 marks

M34.

Answer	Mark	Additional Guidance
Overlapping intervals No time period No 6+ response box	2	**B2** for two correct (**B1** for one correct)
		Total for Question: 2 marks

M35.

	Working	Answer	Mark	Additional Guidance
(a)	1 – (0.3 + 0.2 + 0.1)	0.4 10	2 2	**M1** for 1 – "(0.3 + 0.2 + 0.1)" **A1** for 0.4 oe
(b)	0.2 × 50			**M1** for 0.2 × 50 **A1** for cao SC **B1** for 10/50
				Total for Question: 4 marks

M36.

	Answer	Mark	Additional Guidance
(a)	Overlapping intervals Time frame No 6+ (or none)	2	**B2** for 2 correct 731607245 (**B1** for 1 correct)
(b)	Not representative of all ages Students use computers more	1	**B1** for one acceptable reason
			Total for Question: 3 marks

M37.

Working	Answer	Mark	Additional Guidance
(6 × 5) + (11 × 15) + (8 × 25) + (5 × 35) = 570 "570" – "(6+11+8+5)"	19	4	**M1** for use of fx with x consistent within intervals (including end points) accept one error **M1** (dep) for use of midpoints **M1** (dep on 1st **M1**) for use of $\Sigma fx/\Sigma f$ **A1** cao
			Total for Question: 4 marks

M38.

	Answer	Mark	Additional Guidance
(a)	(67, 50), (70, 50), (75, 40), (80, 25)	2	**B2** for 4 points plotted correctly (allow ±2mm tolerance) (**B1** for 2 or 3 points plotted correctly)
(b)	As the price increases the number of cameras sold decreases	1	**B1** for decrease in number sold with price. (accept negative correlation)
(c)	line of best fit	1	**B1** for line within given limits passing between (70, 40) & (70, 55) and between (80, 15) & (80, 30)
(d)	35 – 39	1	**B1** for 35 – 39 or ft their line of best fit from 74 (allow ±2 mm tolerance)
			Total for Question: 5 marks

M39.

	Working	Answer	Mark	Additional Guidance
(a)	Points plotted		1	**B1** points plotted ±1 full smallest square tolerance.
(b)		Negative	1	**B1**
(c)		lobf	1	**B1** lobf that goes between (8,2000) and (8,2400) and between (24,0) and (24,500)
(d)		11-13	1	**B1** 11-13 or ft (tol ±1 square) from single straight line segment with a negative gradient
(e)		850-1150	1	**B1** 850-1150 or ft (tol ±1 square)) from single straight line segment with a negative gradient
				Total for Question: 5 marks

M40.

	Working	Answer	Mark	Additional Guidance
(a)		$\frac{5}{12}$	2	**M1** for $\frac{n}{12}$ or $n \div 12$ or $\frac{n}{3+4+5}$ or $n \div (3 + 4 + 5)$ where n is an integer ≤ 12 **A1** $\frac{5}{12}$ or 0.41(6…) or 41.6%
(b)	1 – "$\frac{5}{12}$"	$\frac{7}{12}$	1	**B1** ft 1 – "$\frac{5}{12}$" provided the answer is positive, or $\frac{7}{12}$ or 0.58(3…)
				Total for Question: 3 marks

M41.

Answer	Mark	Additional Guidance
Polygon	2	**B2** Complete polygon (ignore histograms and any lines below a mark of 5 or above a mark of 45), but award **B1** if there is a line joining the first to the last point. (**B1** One vertical or horizontal plotting error **OR** incorrect but consistent error in placing the midpoints horizontally **OR** correct plotting but not joined). Plotting tolerance :1/2 square; points to be joined by lines (ruled or hand drawn, but not curves).
		Total for Question: 2 marks

M42.

Answer	Mark	Additional Guidance
$\frac{5}{12}$	2	**M1** for $\frac{n}{12}$ or $n \div 12$ or $n \div$ ("3 + 4 + 5") where n is an integer, where ≤ 12. **A1** $\frac{5}{12}$ or 0.41(6…) or 41.6%
		Total for Question: 2 marks

M43.

	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 × 2 = 16	16	3	**B1** cao
(ii)	360/40 × 8 = 72	72		**M1** 360/40 × 8 oe, or 360/80 × "16" oe, or "16" × 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

M44.

Working	Answer	Mark	Additional Guidance
(0 × 0) + 1 × 8 + 2 × 12 + 3 × 6 + 4 × 4 + 5 × 2 =76 76 ÷ ((0) + 8 + 12 + 6 + 4 + 2)	2.375	3	**M1** for 1 × 8 and 2 × 12 and 3 × 6 and 4 × 4 and 5 × 2 condone one error **or** sight of 76. **M1**(dep on 1st **M1**) for $\Sigma fx \div \Sigma f$ **A1** for 2.375 **or** 2.37 **or** 2.38 **or** 2.4
			Total for Question: 3 marks

M45.

	Answer	Mark	Additional Guidance
(a)	3 plotted correctly	1	**B1** ± 1square
(b)	Positive	1	**B1** for positive (correlation)
(c)	LOBF	1	**B1** for line within guidelines; line goes from between (2, 18) and (2, 32) to between (16, 78) and (16, 90)
(d)	62 – 67	1	**B1** for 62 – 67 **OR** ft from a single straight line graph of positive gradient ± 1 square
			Total for Question: 4 marks

M46.

Working	Answer	Mark	Additional Guidance
1 – (0.15 + 0.05 + 0.20 + 0.25)	0.35	2	**M1** for 1 – (0.15 + 0.05 + 0.20 + 0.25) **A1** for 0.35 oe
			Total for Question: 2 marks

M47.

Answer	Mark	Additional Guidance
30	2	**M1** for finding the middle value or indication of 0, 29, 29.5, 30.5, 31, 31.5, 32 or writing "10th value" oe **A1** cao
		Total for Question: 2 marks

M48.

Working	Answer	Mark	Additional Guidance
15 × 3 = 45 15 × 3.5 25 × 9 = 225 25 × 9.5 20 × 15 = 300 20 × 15.5 12 × 21 = 252 12 × 21.5 8 × 27 = 216 8 × 27.5 1038 ÷ 80 = 1078 ÷ 80 =	12.97 - 13.48	4	**M1** for fx consistently within interval including ends (allow 1 error) **M1** (dep) consistently using appropriate midpoints **M1** (dep on first M) for $\Sigma fx \div \Sigma f$ **A1** for 12.97 – 13.48
			Total for Question: 4 marks

M49.

	Answer	Mark	Additional Guidance
(a)	(65, 100), (80, 110) plotted	1	**B1** for plotting both points (65, 100), (80, 110) correctly (tolerance one square); ignore any additional plots given.
(b)	positive (correlation)	1	**B1** for positive (correlation) or length increases with height oe
(c)	105 – 110	2	**M1** for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 76 **A1** for given answer in the range 105 – 110
			Total for Question: 4 marks

M50.

Working	Answer	Mark	Additional Guidance
$\frac{10 - 46 + 160 + 246 + 225 + 66}{120}$	6.08 hours	4	**M1** for mid interval values **M1** for multiplying frequencies by mid-interval values **M1** for adding (freq × mid-interval values) ÷ 120 **A1** cao
			Total for Question: 4 marks