



# Data (F)

## Intervention Booklet

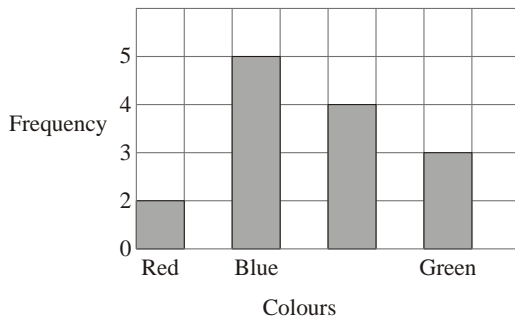
### Tally Charts and Bar Graphs

#### Things to remember:

- The fifth tally mark should make a gate – this makes it easier to count the tally as you can count up in 5s.
- Frequency means total.
- If you are drawing a bar chart, the axes must be labelled.

#### Questions:

1. Ray and Clare are pupils at different schools. They each did an investigation into their teachers' favourite colours. Here is Ray's bar chart of his teachers' favourite colours.



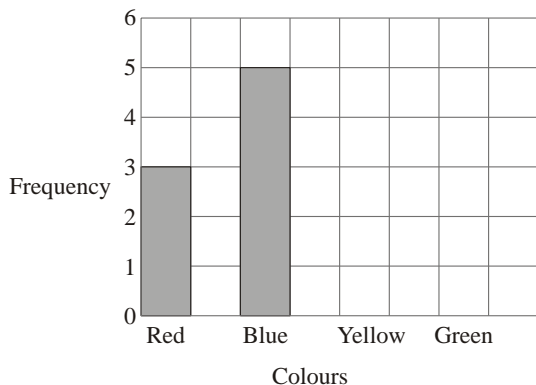
(a) Write down two things that are wrong with Ray's bar chart.

.....

.....

(2)

Clare drew a bar chart of her teachers' favourite colours. Part of her bar chart is shown below.



4 teachers said that Yellow was their favourite colour.  
2 teachers said that Green was their favourite colour.

(b) Complete Clare's bar chart.

(2)

(c) Which colour was the mode for the teachers that Clare asked?

.....

(1)

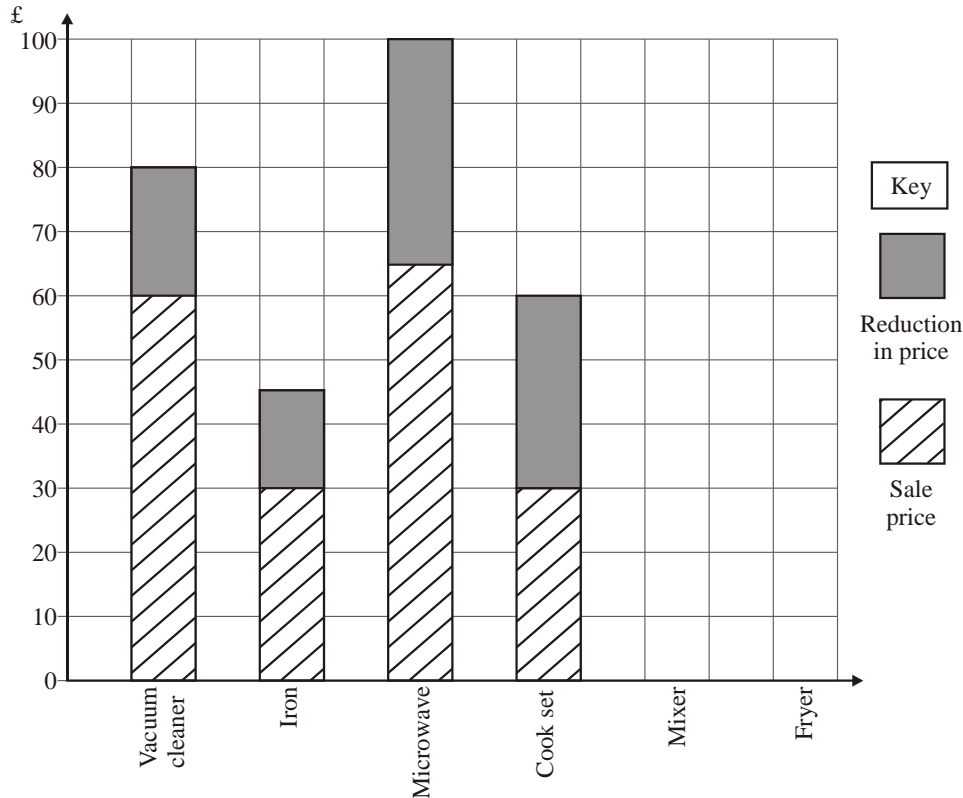
(d) Work out the number of teachers Clare asked.

.....  
(1)

(e) Write down the fraction of the number of teachers that Clare asked who said Red was their favourite colour.

.....  
(1)  
**(Total 7 marks)**

2. A shop has a sale. The bar chart shows some information about the sale.



The normal price of a vacuum cleaner is £80

The sale price of a vacuum cleaner is £60

The price of a vacuum cleaner is reduced from £80 to £60

(a) Find the reduction in the price of the iron.

£ .....  
(1)

(b) Which two items have the same sale price?

..... and .....  
(1)

(c) Which item has the greatest reduction in price?

.....  
(1)

Mixer	
Normal price	£90
Sale price	£70

Fryer	
Normal price	£85
Sale price	£70

(d) Complete the bar chart for the mixer and the fryer.

(2)  
**(Total 7 marks)**

3. Daniel carried out a survey of his friends' favourite flavour of crisps.

Here are his results.

Plain	Chicken	Bovril	Salt & Vinegar	Plain
Salt & Vinegar	Plain	Chicken	Plain	Bovril
Plain	Chicken	Bovril	Salt & Vinegar	Bovril
Bovril	Plain	Salt & Vinegar	Plain	

(a) Complete the table to show Daniel's results.

Flavour of crisps	Tally	Frequency
Plain		
Chicken		
Bovril		
Salt & Vinegar		

(3)

(b) Write down the number of Daniel's friends whose favourite flavour was Salt & Vinegar.

.....  
(1)

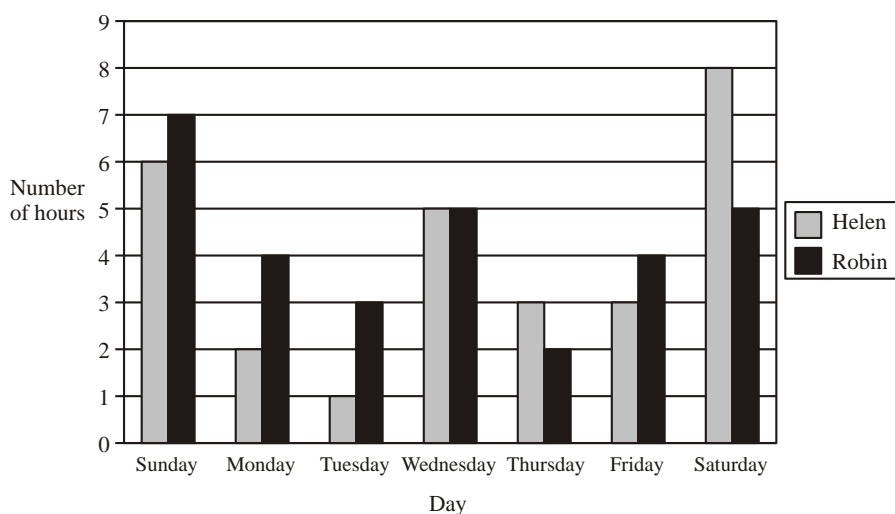
(c) Which was the favourite flavour of most of Daniel's friends?

.....  
(1)

**(Total 5 marks)**

4. Here is a bar chart showing the number of hours of TV that Helen and Robin watched last week.

Hours of TV watched last week



(a) Write down the number of hours of TV that Helen watched on Monday.

.....hours  
(1)

(b) On which day did Helen and Robin watch the same number of hours of TV?

.....  
(1)

(c) (i) Work out the total number of hours of TV that Robin watched on Friday and Saturday.

.....hours

(ii) Who watched the greater number of hours of TV on Friday and Saturday? Show your working.

(3)

**(Total 5 marks)**

5. Heather carried out a survey about her friends' pets. Here are her results.

Cat            Cat            Dog            Hamster      Cat  
Dog            Hamster      Cat            Cat            Dog  
Hamster      Dog            Hamster      Dog            Fish  
Cat            Dog            Fish            Cat            Cat

Complete the table to show Heather's results.

Pet	Tally	Frequency
Cat		
Dog		
Fish		
Hamster		

**(Total 3 marks)**


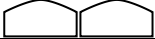

## Pictograms


### Things to remember:

- Use the key!
- Once you have the number the whole picture represents you can work out what the picture would be to represent 1 or 2 etc.

### Questions:

1. The pictogram shows the numbers of loaves of bread made by Miss Smith, Mr Jones and Mrs Gray.

Miss Smith	
Mr Jones	
Mrs Gray	
Ms Shah	
Mr Khan	

 represents 20 loaves of bread

Write down the number of loaves of bread made by Mr Jones.

.....  
(1)

- (b) Write down the number of loaves of bread made by Mrs Gray.

.....  
(1)

Ms Shah made 60 loaves of bread.




Mr Khan made 90 loaves of bread.


- (c) Use this information to complete the pictogram.

(2)

**(Total 4 marks)**

2. The pictogram gives information about the number of goals scored in a local football league in each of 3 weeks.

First week	
Second week	
Third week	
Fourth week	
Fifth week	

Key:  represents 4 goals

- (a) Find the number of goals scored in the first week.

.....  
(1)

- (b) Find the number of goals scored in the third week.

.....  
(1)

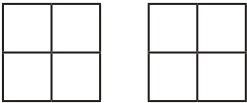
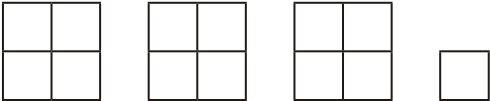
8 goals were scored in the fourth week.

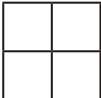
5 goals were scored in the fifth week.

- (c) Complete the pictogram.

(2)  
(Total 4 marks)

3. Sharif buys some fruit. The pictogram shows information about the number of apples and the number of oranges he buys.

Apples	
Oranges	
Peaches	

Key:  represents 8 fruit

- (a) Write down the number of apples he buys.

.....  
(1)

- (b) Write down the number of oranges he buys.

.....  
(1)

Sharif buys 12 peaches.

- (c) Use this information to complete the pictogram.

(1)  
(Total 3 marks)

## Averages

### Things to remember:

- Mode is most – the number that occurs the most frequently.
- Median is middle – put the numbers in order then identify the middle number.
- Mean is mean to work out – add all the numbers together and divide by the quantity in the list.
- Range is the difference from the biggest to the smallest.

### Questions:

1. Chloe made a list of her homework marks.

4 5 5 5 4 3 2 1 4 5

(a) Write down the mode of her homework marks.

.....  
(1)

(b) Work out her mean homework mark.

.....  
(2)  
**(Total 3 marks)**

2. Peter rolled a 6-sided dice ten times.

Here are his scores.

3 2 4 6 3 3 4 2 5 4

(a) Work out the median of his scores.

.....  
(2)

(b) Work out the mean of his scores.

.....  
(2)

(c) Work out the range of his scores.

.....  
(1)  
**(Total 5 marks)**

3. Mr Smith kept a record of the number of absences for each student in his class for one term.

Here are his results.

0 0 0 8 4 5 5 3 2 1

(a) Write down the mode.

.....  
(1)

(b) Work out the mean.

.....  
(2)  
**(Total 3 marks)**

4. Here are ten numbers.  
7    6    8    4    5    9    7    3    6    7

(a) Work out the range.

.....  
(2)

(b) Work out the mean.

.....  
(2)

**(Total 4 marks)**

5. Here are the test marks of 6 girls and 4 boys.

Girls: 5    3    10    2    7    3

Boys: 2    5    9    3

(a) Write down the mode of the 10 marks.

.....  
(1)

(b) Work out the median mark of the **boys**.

.....  
(2)

(c) Work out the range of the **girls'** marks.

.....  
(1)

(d) Work out the mean mark of all 10 students.

.....  
(2)

**(Total 6 marks)**

6. Here are 10 numbers.

3    2    5    4    2    4    6    2    1    2

Find the mode of these numbers.

.....  
**(Total 1 mark)**

7. Jalin wrote down the ages, in years, of seven of his relatives.

45,    38,    43,    43,    39,    40,    39

(a) Find the median age.

.....  
(1)

(b) Work out the range of the ages.

.....  
(1)

(c) Work out the mean age.

.....  
(2)

**(Total 4 marks)**



8. Mrs Smith asked each student in her class to record the numbers of times they used their mobile phone last Saturday.

Here are the results for the boys.

Boys            8        10        8        9        7        9        8        13        14

(a) Work out the median.

.....  
(2)

Here are the results for the girls.

Girls            6        8        9        9        10        14        14

\*(b) Compare the numbers of times the boys used their mobile phones with the numbers of times the girls used their mobile phones.

(4)

**(Total for question = 6 marks)**

9. There are 18 packets of sweets and 12 boxes of sweets in a carton.  
The mean number of sweets in all the 30 packets and boxes is 14  
The mean number of sweets in the 18 packets is 10  
Work out the mean number of sweets in the boxes.

.....  
**(Total for question = 3 marks)**

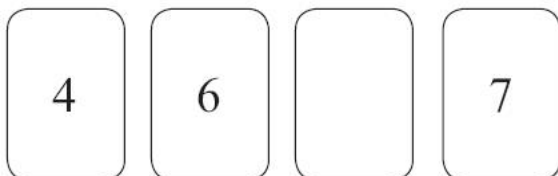
10. 25 students in class A did a science exam.  
30 students in class B did the same science exam.  
The mean mark for the 25 students in class A is 67.8  
The mean mark for all the 55 students is 72.0  
Work out the mean mark for the students in class B.

.....  
(Total for Question is 3 marks)

11. There are 10 boys and 20 girls in Mrs Brook's class.  
Mrs Brook gave all the class a test.  
The mean mark for all the class is 60  
The mean mark for the girls is 56  
Work out the mean mark for the boys.

.....  
(Total for Question is 3 marks)

12. Here are four number cards.  
One of the cards is turned over so you cannot see the number on it.



The mean of the four numbers is 6  
Work out the number you **cannot** see.

.....  
(Total for Question 10 is 3 marks)

- \*13.** There are two trays of plants in a greenhouse.  
 The first tray of plants was given fertiliser.  
 The second tray of plants was not given fertiliser.  
 On Monday the heights of the plants were measured in centimetres.  
 The boxes show some information about the heights of the plants.

Heights of the plants given fertiliser							
22	29	30	35	37	40	44	47
48	48	54	56	59	66	72	

Information about the heights of plants not given fertiliser			
Smallest	18	Lower quartile	26
Largest	64	Upper quartile	47
Median	44		

Compare the distribution of the heights of the plants given fertiliser to the distribution of the heights of the plants not given fertiliser.

**(Total for Question is 4 marks)**

- 14.** 23 girls have a mean height of 153 cm.  
 17 boys have a mean height of 165 cm.  
 Work out the mean height of all 40 children.

..... cm  
**(Total for Question is 3 marks)**

15. Hertford Juniors is a basketball team.  
At the end of 10 games, their mean score is 35 points per game.  
At the end of 11 games, their mean score has gone down to 33 points per game.  
How many points did the team score in the 11th game?

.....  
**(Total for Question is 3 marks)**

16. Mr Brown gives his class a test.  
The 10 girls in the class get a mean mark of 70%  
The 15 boys in the class get a mean mark of 80%

Nick says that because the mean of 70 and 80 is 75 then the mean mark for the whole class in the test is 75%  
Nick is not correct.

Is the correct mean mark less than or greater than 75%?  
You must justify your answer.

.....  
.....  
.....

**(Total for question = 2 marks)**

17. Walkden Reds is a basketball team.  
At the end of 11 games, their mean score was 33 points per game.  
At the end of 10 games, their mean score was 2 points higher.

Jordan says,  
"Walkden Reds must have scored 13 points in their 11th game."

Is Jordan right?  
You must show how you get your answer.

.....  
**(Total for question is 3 marks)**

## Pie Charts

### Things to remember:

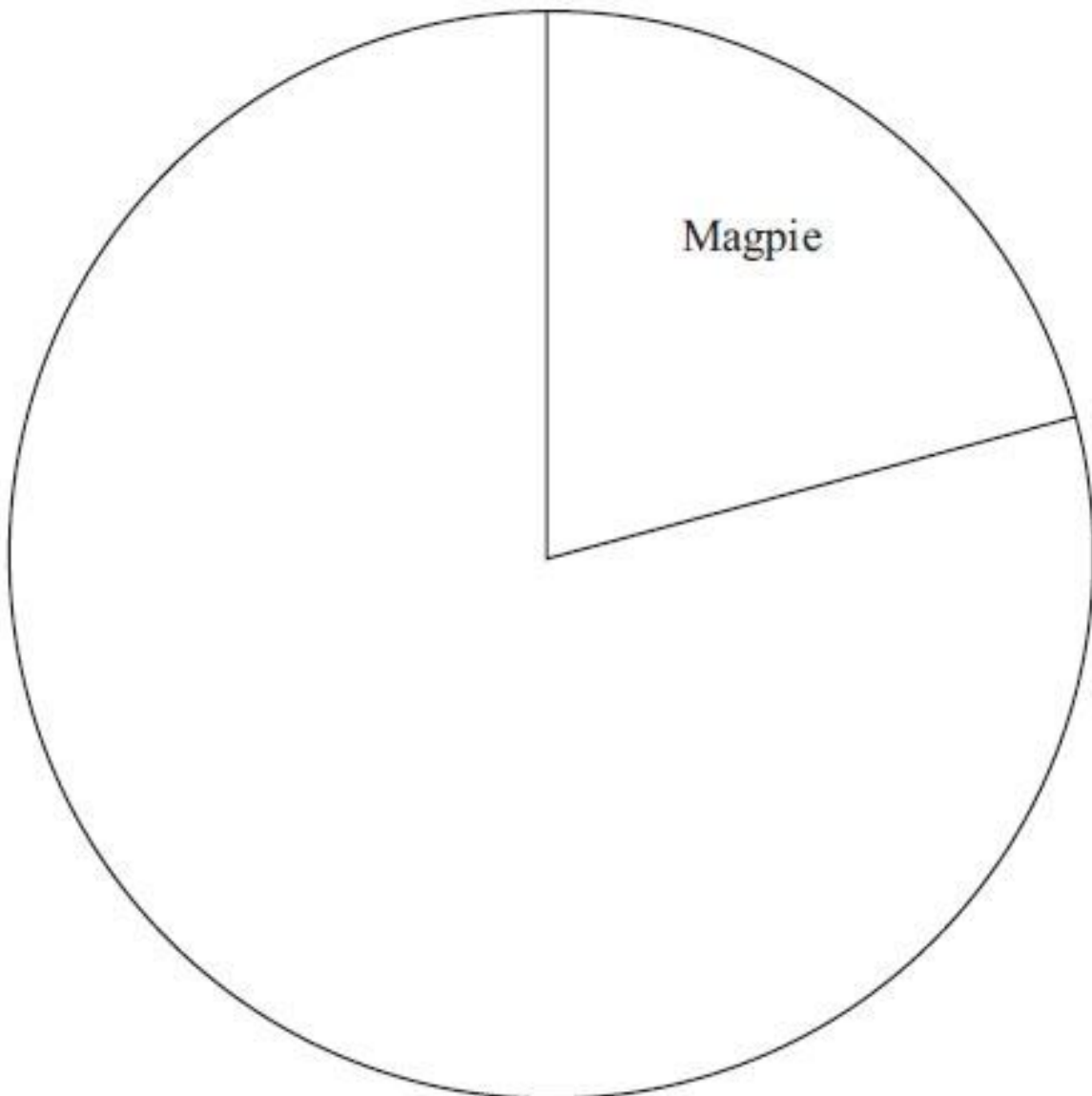
- All the angles in a pie chart sum to  $360^\circ$ .
- Work out what to multiply the total by to scale up to  $360^\circ$ . This is the scale factor for all the groups in the pie chart.
- Be careful when comparing pie charts – remember they represent proportions, not specific quantities.

### Questions:

1. The table gives some information about the birds Paula sees in her garden one day.

Bird	Frequency
Magpie	15
Thrush	10
Starling	20
Sparrow	27

Complete the accurate pie chart.

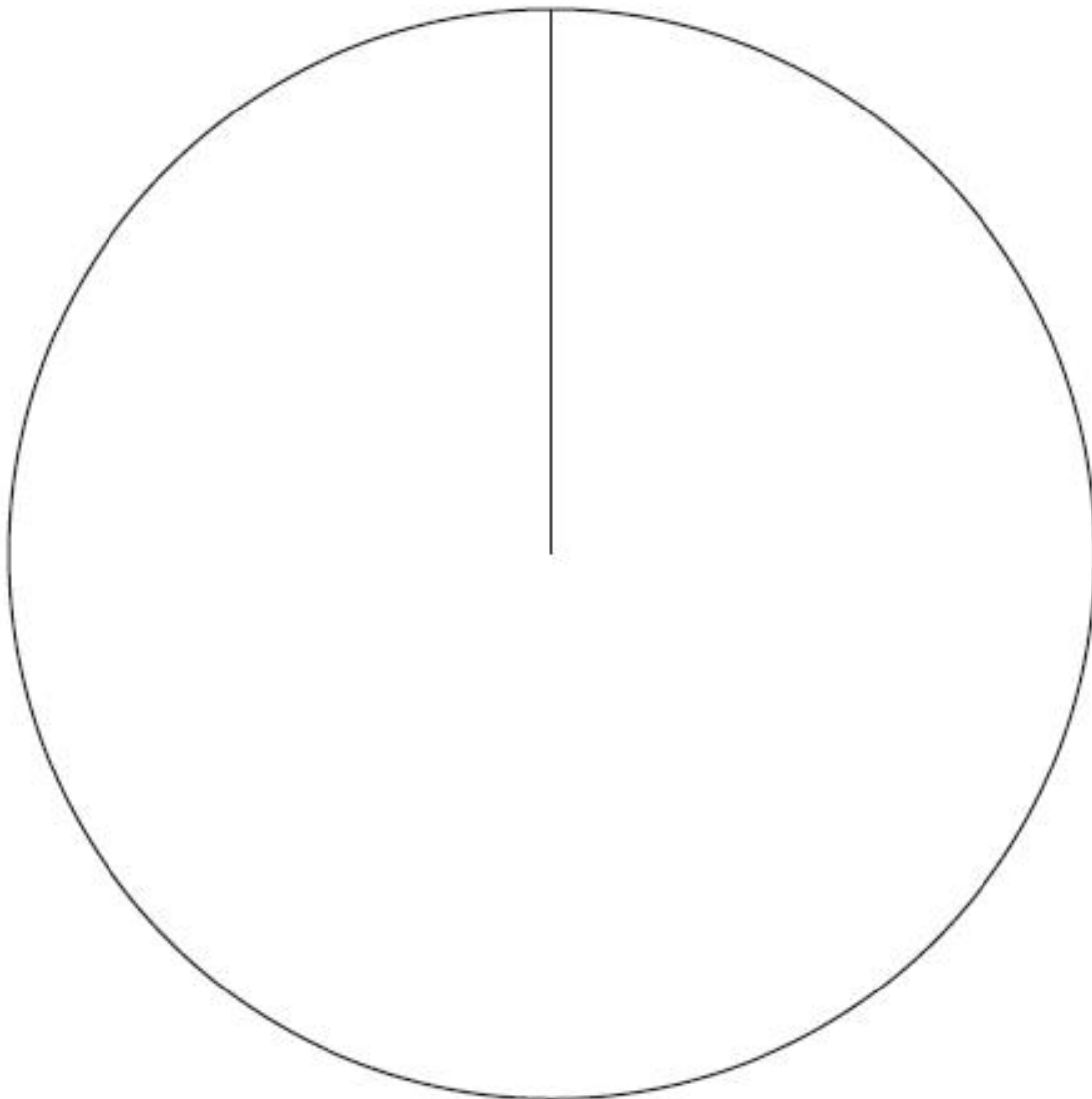


(Total for Question is 3 marks)

2. The table gives information about the results of the matches a football team played.

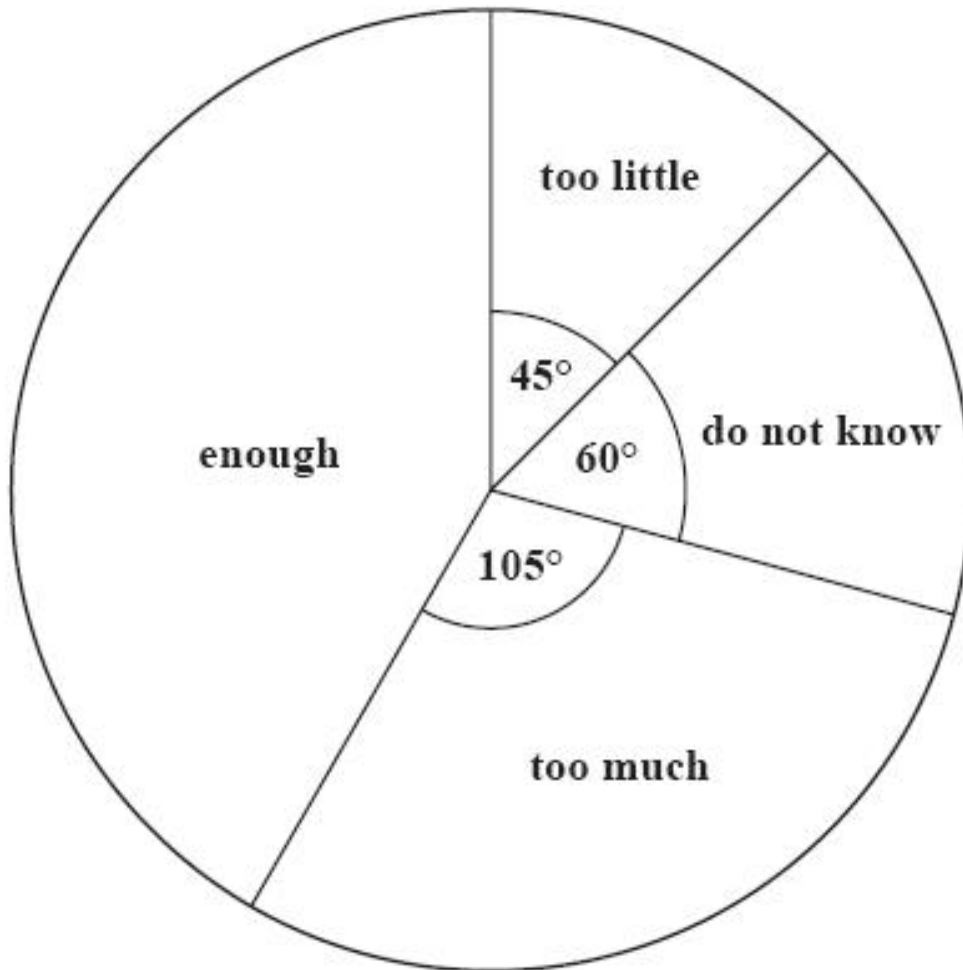
Result	Frequency	
Won	28	
Drawn	12	
Lost	20	

Draw an accurate pie chart to show this information.



**(Total for Question is 4 marks)**

3. 120 students are asked if they have enough homework one night. The pie chart shows some information about their answers.



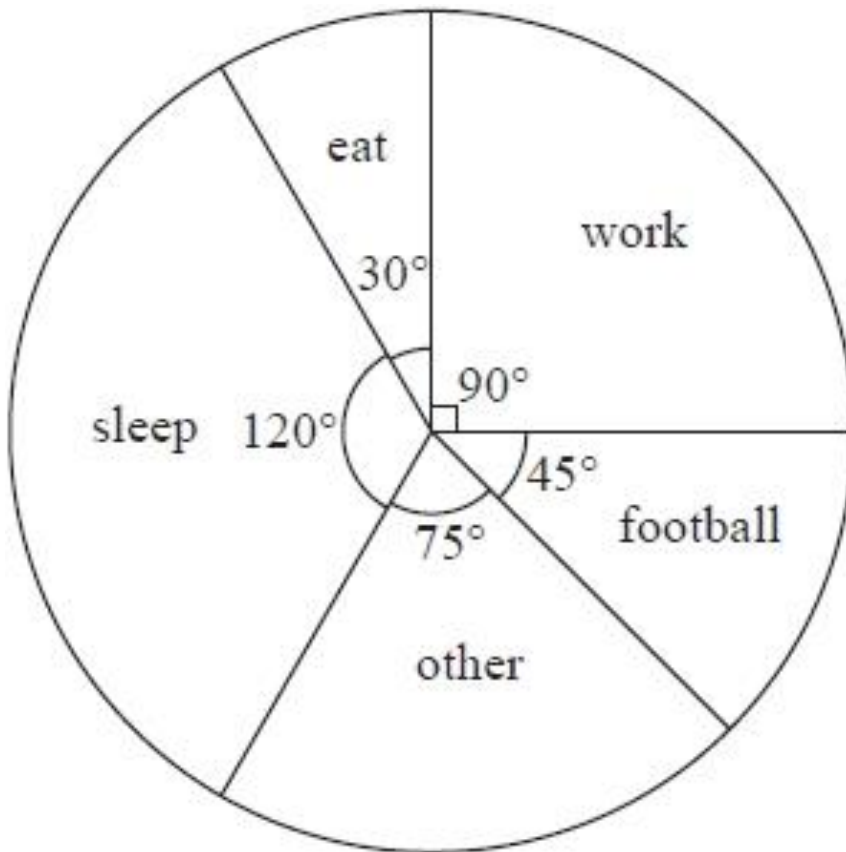
- (a) Work out the number of students who answered do not know.

.....  
(2)

- (b) Work out the number of students who answered enough.

.....  
(3)  
(Total for question = 5 marks)

4. The pie chart gives information about what Ryan did in 24 hours one Saturday.



(a) What did Ryan do most?

..... (1)

(b) Write down the fraction of the pie chart that shows when Ryan was working.

..... (1)

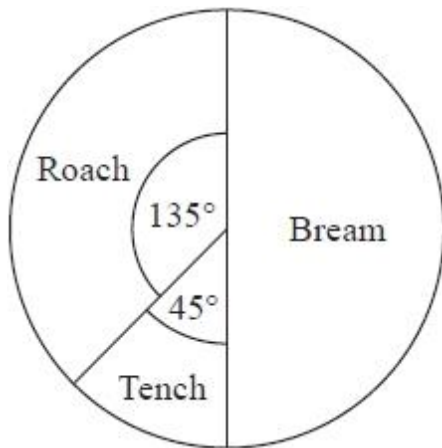
(c) How many hours did Ryan do football?

..... hours (2)

(Total for question = 4 marks)



5. The pie chart shows information about the types of fish Simon caught on Saturday.

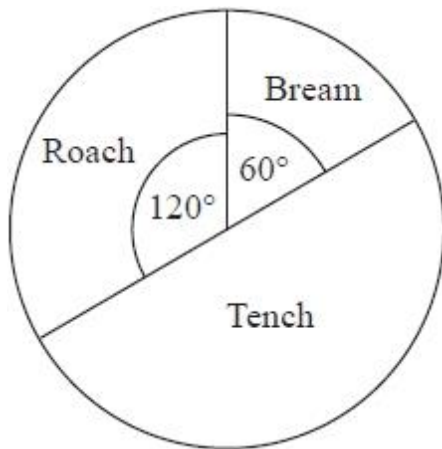


Simon caught 2 tench.

- (a) Work out the total number of fish Simon caught.

.....  
(2)

This pie chart shows information about the types of fish Asif caught on Saturday.



Debbie says,

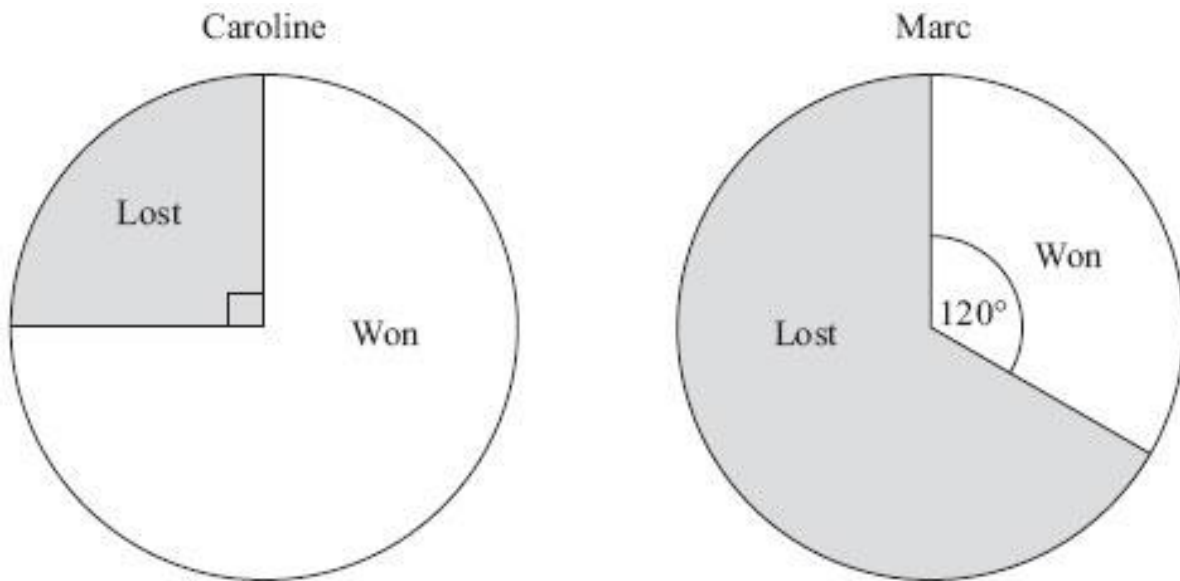
"The pie charts show that Simon caught more roach than Asif caught on Saturday."

- (b) Is Debbie correct?  
Explain your answer.

.....  
.....

(1)  
(Total for question = 3 marks)

6. Caroline and Marc are in a darts team.  
The pie charts show information about the number of games Caroline and Marc each won last year.  
They also show information about the number of games Caroline and Marc each lost last year.

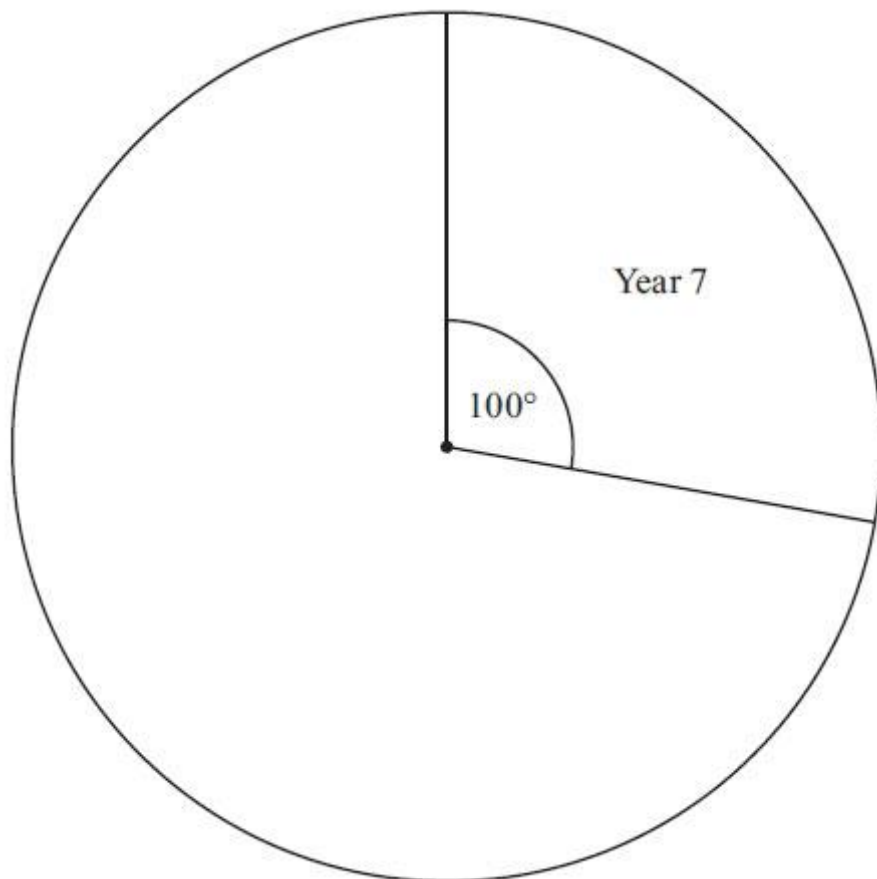


Caroline played 52 games.  
Marc played 150 games.  
Marc won more games than Caroline.  
How many more?

.....  
**(Total for Question is 3 marks)**

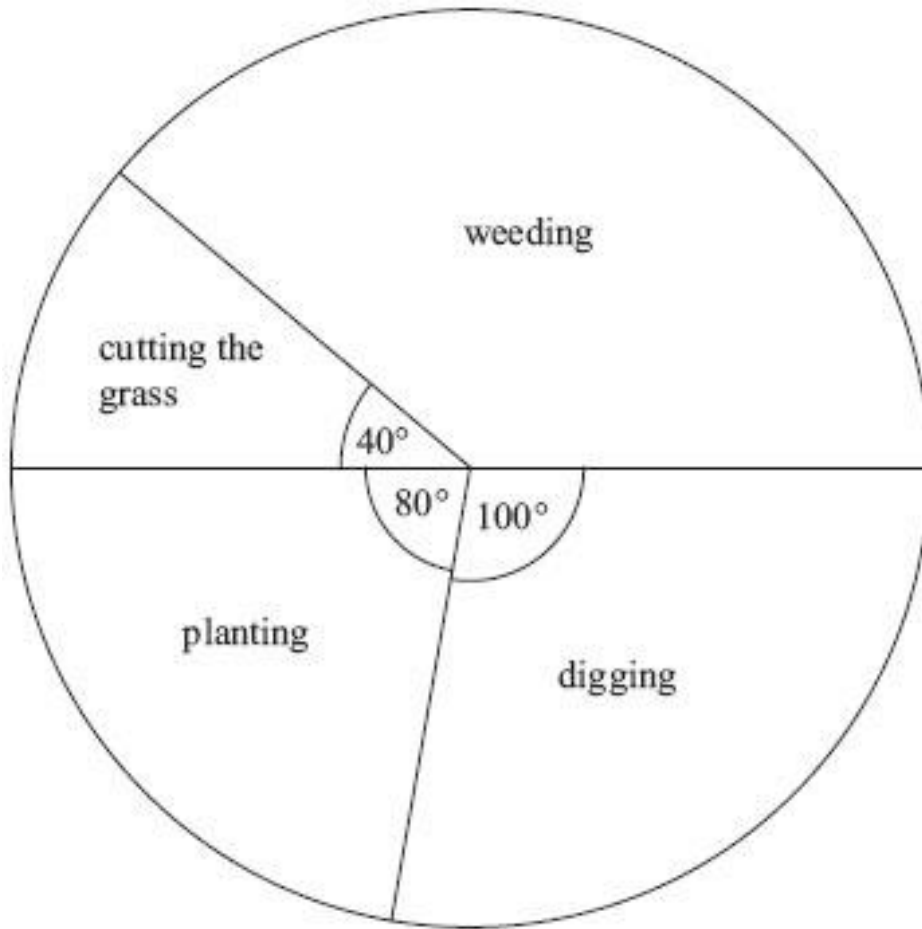
7. Each year group in a school raised money for charity.  
The incomplete table and pie chart show some information about this.  
Complete the table.

Year Group	Amount raised
7	
8	£225
9	
10	£125
11	£162.50
<b>Total</b>	<b>£900</b>



(Total for Question is 3 marks)

8. The pie chart shows some information about the time Gill spent working in her garden one month.



- (a) What fraction of the time did Gill spend cutting the grass?

.....  
(1)

Gill spent 7 hours weeding.

- (b) How much time did Gill spend planting?

.....  
(3)

**(Total for Question is 4 marks)**

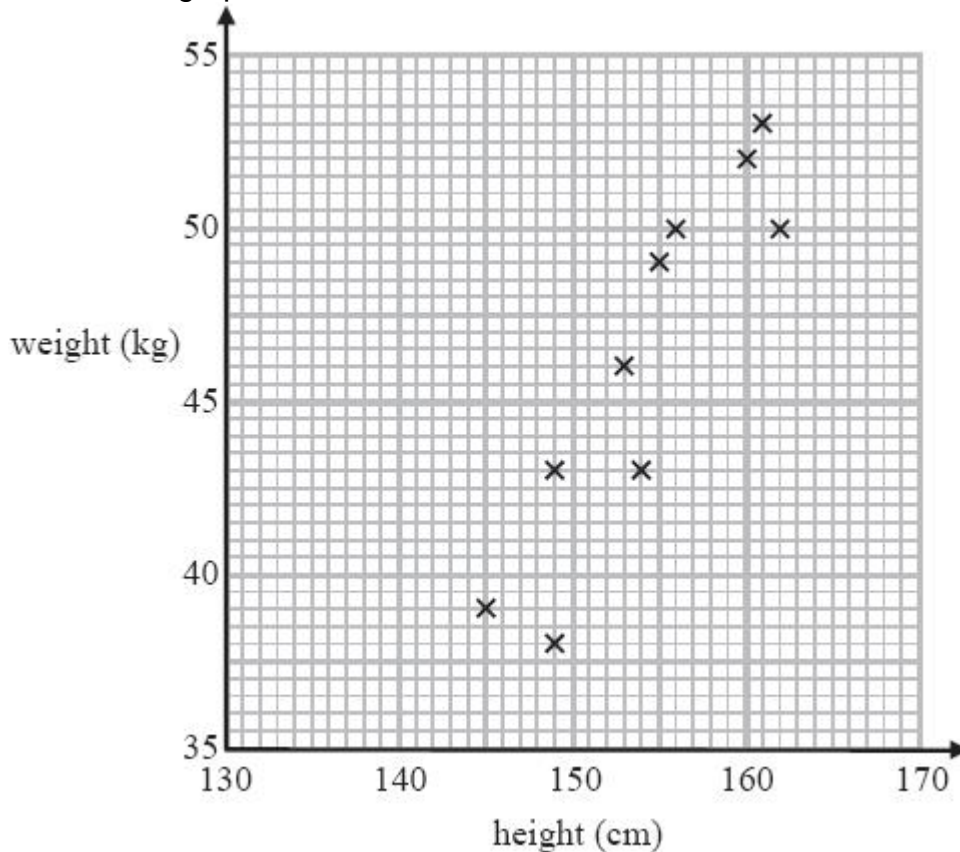
# Scatter Graphs

## Things to remember:

- Check the scale carefully when plotting points. If it helps, write in more numbers on the scale.
- Always draw a line of best fit
- When estimating a value show lines on your graph.
- You can describe a relationship by using the words “positive correlation” or “negative correlation.” Make sure you include the word correlation.

## Questions:

1. Leon recorded the height, in cm, and the weight, in kg, of each of ten students. The scatter graph shows information about his results.



A different student has a height of 146 cm and a weight of 41 kg.

(a) Plot this information on the scatter graph.

(1)

(b) Describe the relationship between the height and the weight of these students.

.....  
(1)

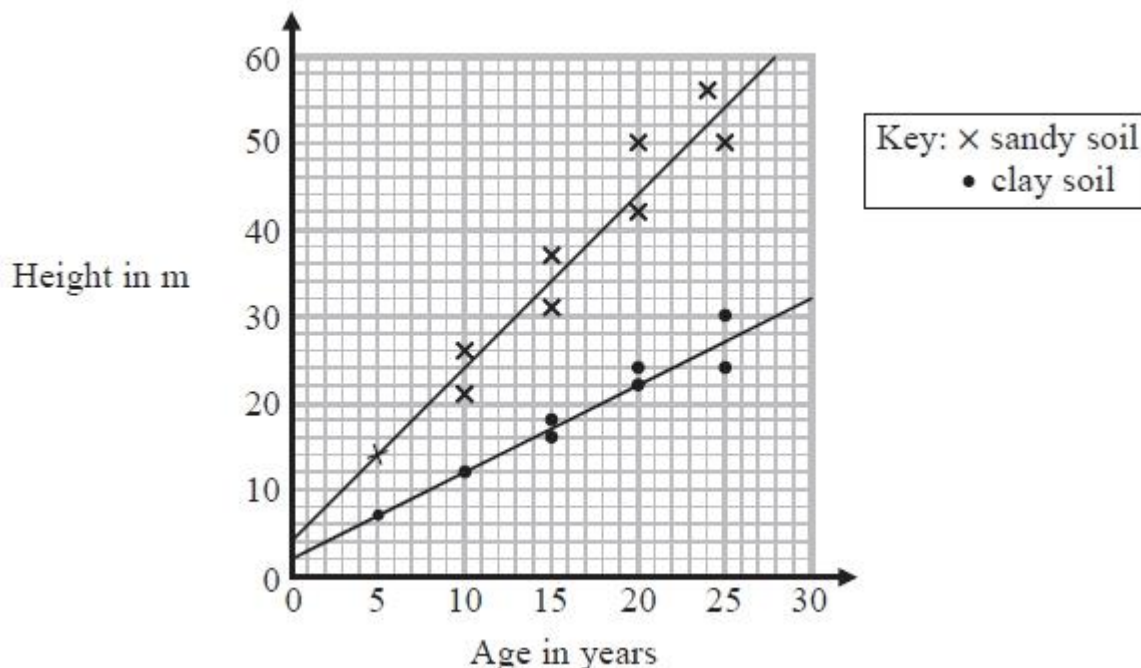
A student has a weight of 47.5 kg.

(c) Use the scatter graph to estimate the height of this student.

..... cm  
(2)

(Total for question = 4 marks)

2. Bill wants to compare the heights of pine trees growing in sandy soil with the heights of pine trees growing in clay soil. The scatter diagram gives some information about the heights and the ages of some pine trees.



- (a) Describe the relationship between the height of pine trees and the age of pine trees growing in sandy soil.

.....  
(1)

A pine tree growing in clay soil is 18 years old.

- (b) Find an estimate for the height of this tree.

.....m  
(1)

A pine tree is growing in sandy soil.

- (c) Work out an estimate for how much the height of this tree increases in a year.

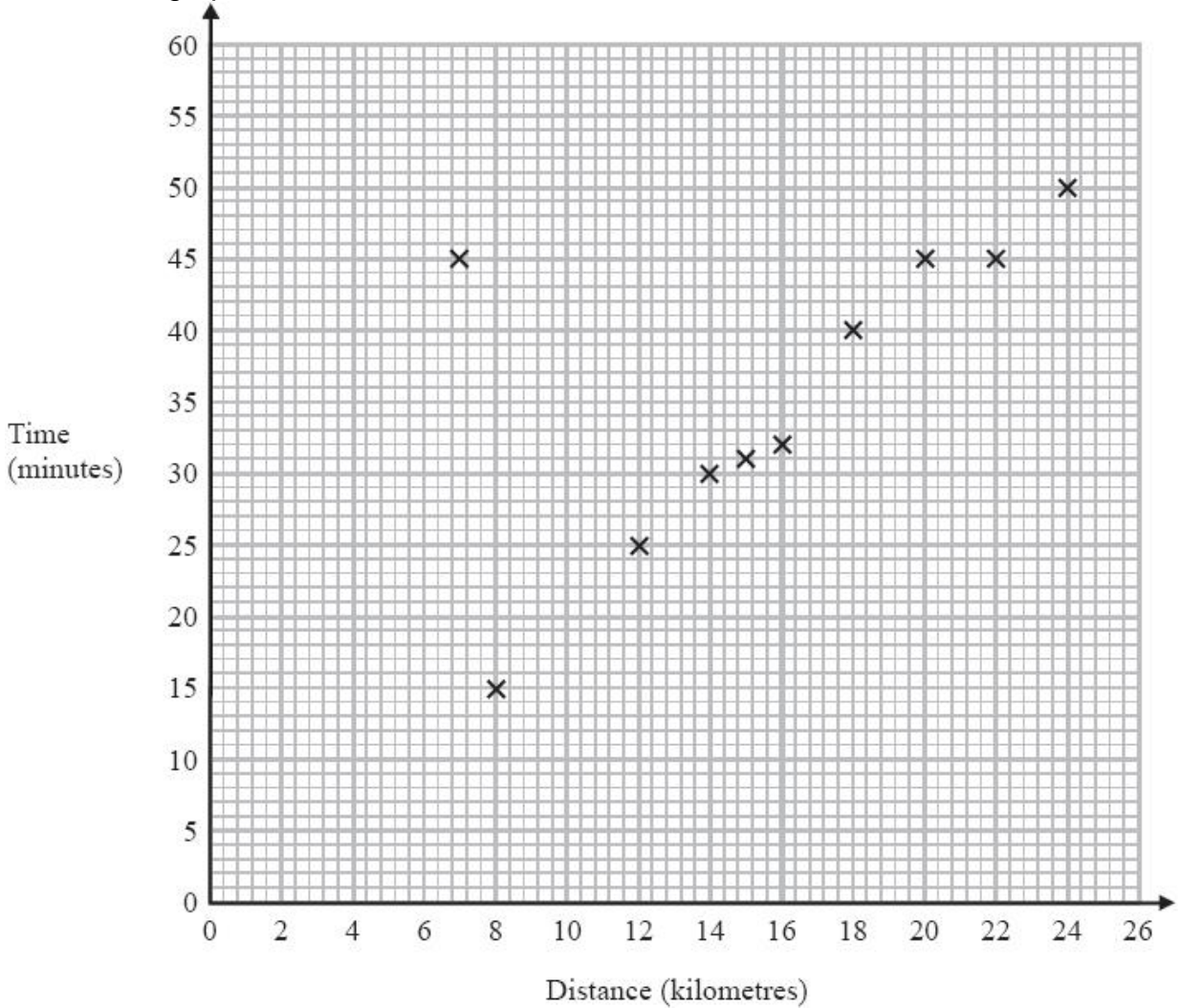
.....m  
(2)

- (d) Compare the rate of increase of the height of trees growing in clay soil with the rate of increase of the height of trees growing in sandy soil.

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

(Total for question = 6 marks)

3. A delivery driver records for each delivery the distance he drives and the time taken. The scatter graph shows this information.



For another delivery he drives 22 kilometres and takes 50 minutes.

- (a) Show this information on the scatter graph. (1)
- (b) What type of correlation does the scatter graph show?

..... (1)

The driver has to drive a distance of 10km for his next delivery.

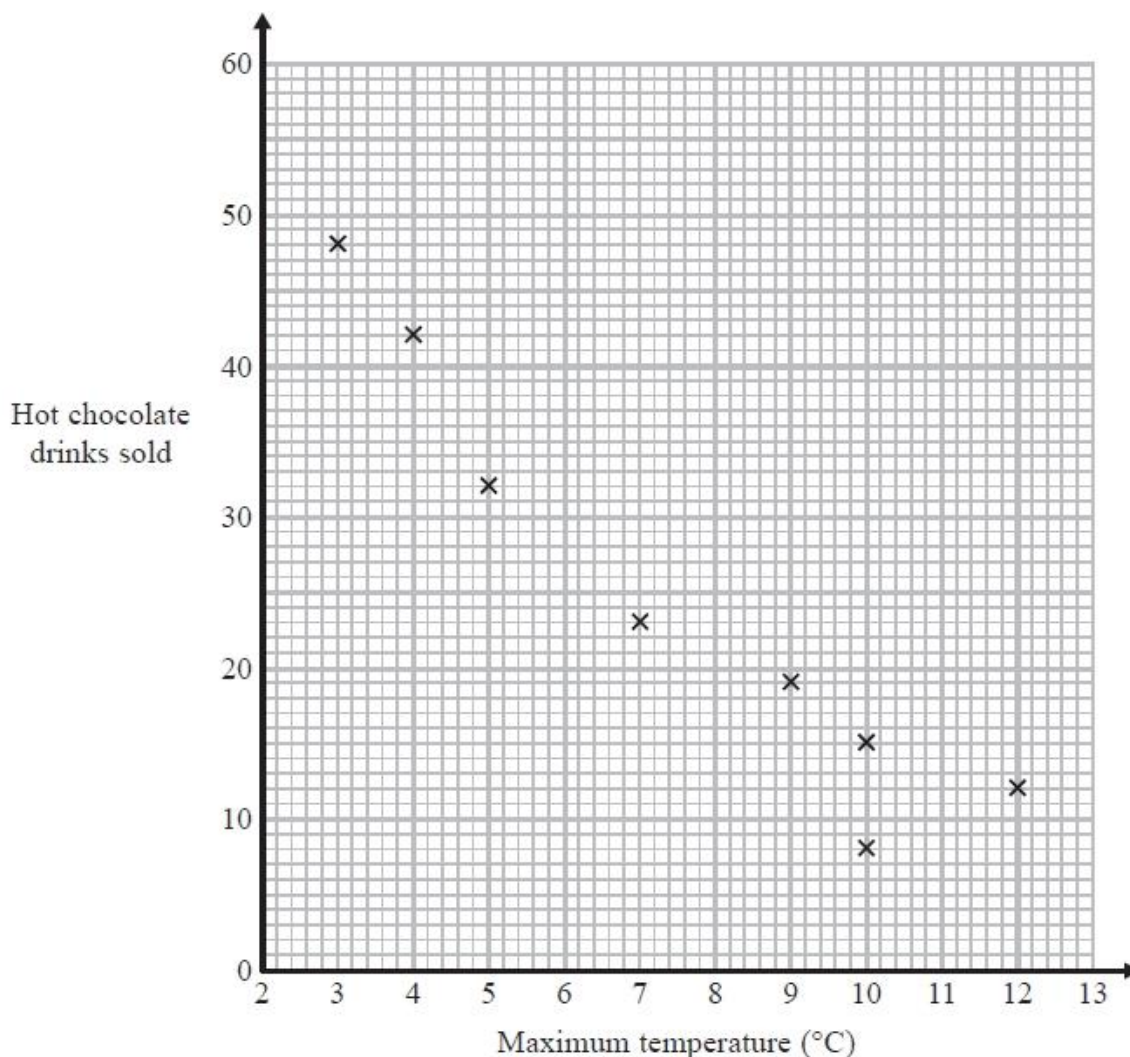
- (c) Estimate the time taken for this delivery.
- ..... minutes (2)

During one of the deliveries, the driver was delayed by road works.

- (d) Using the graph write down the time taken for this delivery.
- ..... minutes (1)

**(Total for question = 5 marks)**

4. Carlos has a cafe in Clacton. Each day, he records the maximum temperature in degrees Celsius ( $^{\circ}\text{C}$ ) in Clacton and the number of hot chocolate drinks sold. The scatter graph shows this information.



On another day the maximum temperature was  $6^{\circ}\text{C}$  and 35 hot chocolate drinks were sold.

- (a) Show this information on the scatter graph. (1)
- (b) Describe the relationship between the maximum temperature and the number of hot chocolate drinks sold.

.....

..... (1)

- (c) Draw a line of best fit on the scatter diagram. (1)

One day the maximum temperature was  $8^{\circ}\text{C}$ .

- (d) Use your line of best fit to estimate how many hot chocolate drinks were sold.

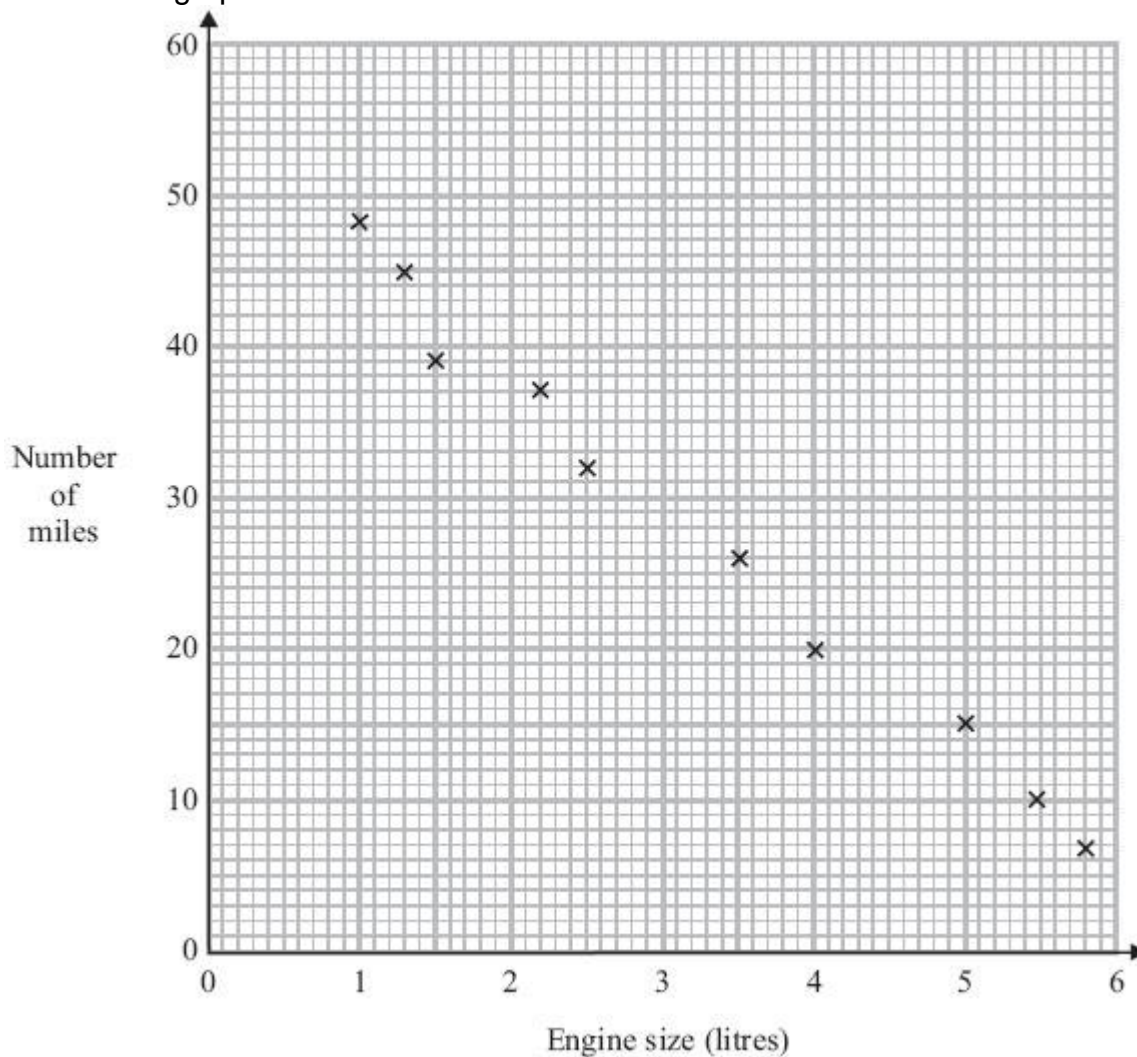
.....

**(1)**

**(Total for Question is 4 marks)**



5. A car company records the number of miles cars of different engine sizes, in litres, travel using one gallon of fuel. The scatter graph shows this information.



Another car has an engine size of 1.8 litres and travels 42 miles using one gallon of fuel.

- (a) Plot this information on the scatter graph. (1)
- (b) What type of correlation does this scatter graph show? (1)

..... miles (1)

- (c) Draw a line of best fit. (1)

A car has an engine size of 2.8 litres.

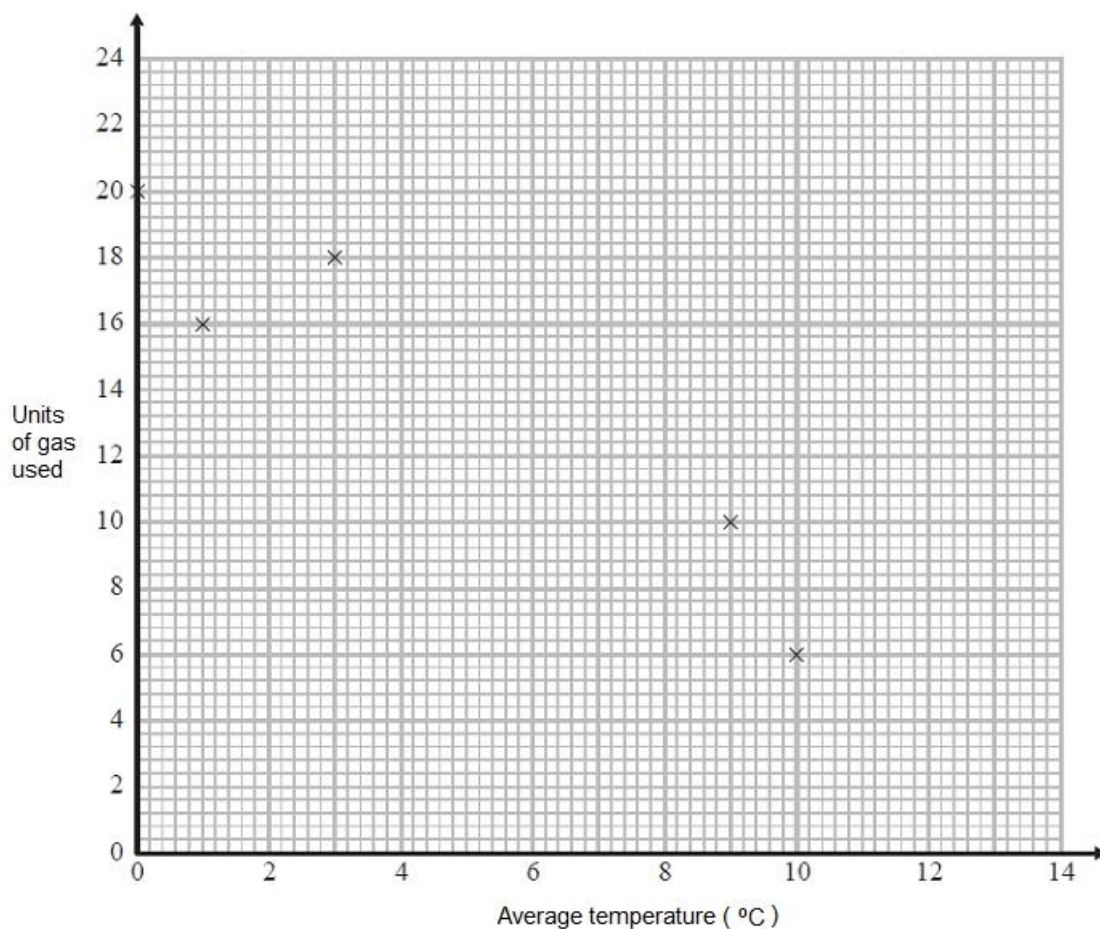
- (d) Find an estimate for the number of miles this car travels using one gallon of fuel.

..... miles (1)

**(Total for Question is 4 marks)**

6. The table shows the average temperature on each of seven days and the number of units of gas used to heat a house on these days.

Average temperature (°C)	0	1	3	9	10	12	13
Units of gas used	20	16	18	10	6	6	2



- (a) Complete the scatter graph to show the information in the table. The first 5 points have been plotted for you. (1)
- (b) Describe the relationship between the average temperature and the number of units of gas used.

.....

.....

- (c) Estimate the average temperature on a day when 12 units of gas are used. (1)

..... °C

(2)

**(Total for Question is 4 marks)**

## Averages from Tables

### Things to remember:

- The mode is the one with the highest frequency.
- To calculate the median, find where the middle value is located by using  $\frac{n+1}{2}$ .
- The mean is given by  $\frac{\Sigma fx}{\Sigma f}$ , ie. the total frequency x midpoint divided by the total frequency.
- Always look back at the data to check your answer looks realistic.

### Questions:

1. 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)

2. 30 adults took part in a survey. They were each asked how much money they spent on lottery tickets last week. The table shows the results of the survey.

Money (£)	Frequency	
0	5	
2	16	
4	6	
20	2	
30	1	

Work out the mean amount of money the 30 adults spent on lottery tickets.

£ .....  
(Total 3 marks)

3. 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)

4. 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)

5. Fred did a survey on the areas of pictures in a newspaper. The table gives information about the areas.

Area ( $A$ cm <sup>2</sup> )	Frequency
$0 < A \leq 10$	38
$10 < A \leq 25$	36
$25 < A \leq 40$	30
$40 < A \leq 60$	46

Work out an estimate for the mean area of a picture.

..... cm<sup>2</sup>  
(Total 4 marks)

6. The table gives some information about the time taken by a group of 100 students to complete an IQ test.

Time ( $t$ seconds)	Frequency	
$60 < t < 70$	12	
$70 < t < 80$	22	
$80 < t < 90$	23	
$90 < t < 100$	24	
$100 < t < 110$	19	

- (a) Write down the modal class interval.

.....  
(1)

- (b) Calculate an estimate for the mean time taken by the students.

..... seconds  
(4)  
(Total 5 marks)

7. The table gives some information about the time taken by a group of 100 students to complete an IQ test.

Time ( $t$ seconds)	Frequenc y	
$60 < t \leq 70$	12	
$70 < t \leq 80$	22	
$80 < t \leq 90$	23	
$90 < t \leq 100$	24	
$100 < t \leq 110$	19	

Calculate an estimate for the mean time taken by the students.

..... seconds  
(Total 4 marks)