
Question 1

The table below shows the monthly payment for an insurance scheme. The payments depend on the age at which a person starts paying. There are two rates, Standard Rate and Discount Rate.

Age	Monthly Payments per Person	
	Standard Rate in pounds	Discount Rate in pounds
0 - 16	7.20	6.12
17 - 19	12.60	10.71
20 - 39	17.00	14.45
40 - 59	23.40	19.89
60 - 74	41.40	35.19
75 and over	84.80	72.08

Alison is aged 17. She pays the Standard Rate.

- (a) i) Write down Alison's monthly payment.
ii) Work out the total amount Alison will pay in a year.

Mr Masih pays at the Discount Rate.

He pays £19.89 each month.

If he were one year older, he would pay £35.19 each month.

- (b) How old is Mr Masih?

The standard monthly payment for an insurance scheme for Tom is £7.20.

This is reduced for the Discount monthly payment to £6.12.

- (c) Work out the percentage reduction.

Question 2

A garage keeps records of the costs of repairs to its customers' cars. The table gives information about the costs of all repairs which were less than £250 in one week.

Cost, (£ C)	Frequency
$0 < C \leq 50$	4
$50 < C \leq 100$	8
$100 < C \leq 150$	7
$150 < C \leq 200$	10
$200 < C \leq 250$	11

(a) Find the class interval in which the median lies

.....
(2 marks)

There was only one further repair that week, not included in the table. That repair cost £1000.

Dave says 'The class interval in which the median lies will change.'

(b) Is Dave correct? Explain your answer.

.....
.....
(1 mark)

The garage also sells cars. It offers a discount of 20% off the normal price for cash.

Dave pays £5200 cash for a car.

(c) Calculate the normal price of the car.

£
(3 marks)

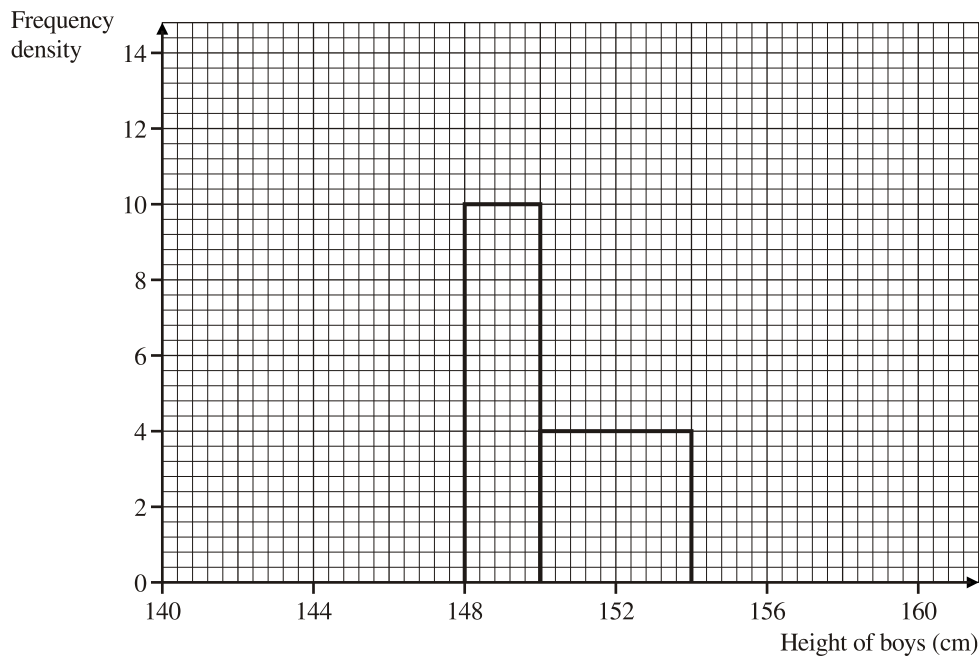
Question 3

Alan is doing a survey of the heights of boys and girls in Year 7.
He first takes a random sample of 70 boys from Year 7.

- (a) Suggest a suitable method that Alan could use to take a random sample. **(2 marks)**

The table and the incomplete histogram show information about the boys' heights in this sample of 70 boys.

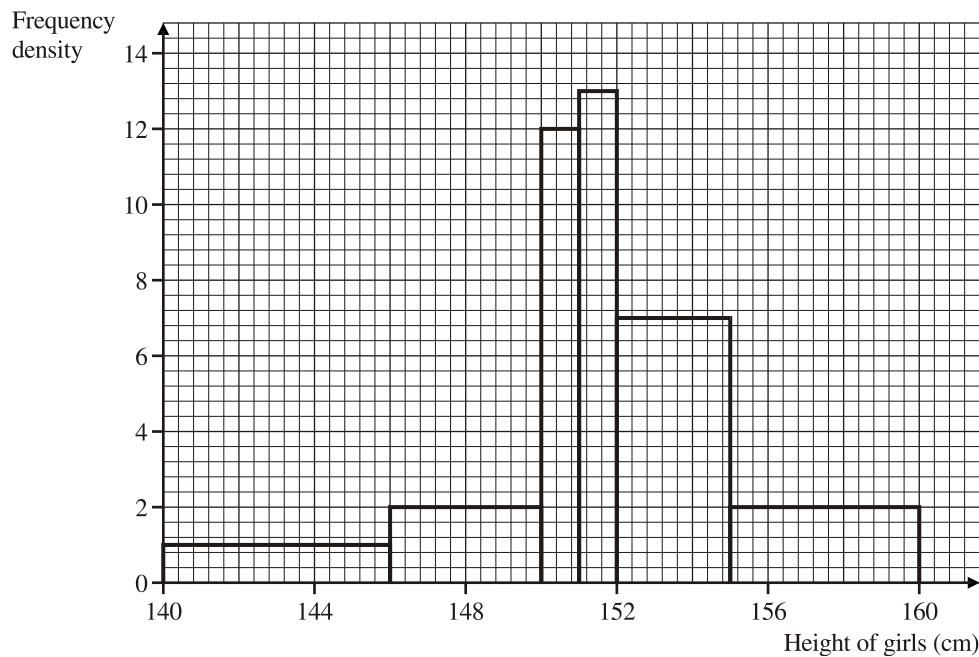
Heights of boys h centimetres	Frequency
$140 \leq h < 145$	10
$145 \leq h < 148$	15
$148 \leq h < 150$	20
$150 \leq h < 154$	16
$154 \leq h < 157$	9



- (b) Use the information in the table to complete the histogram. **(3 marks)**

Alan then takes a random sample of 70 girls from Year 7.
The histogram and the incomplete table show information about the girls' heights in this sample of 70 girls.

Heights of girls h centimetres	Frequency
$140 \leq h < 146$	
$146 \leq h < 150$	
$150 \leq h < 151$	
$151 \leq h < 152$	13
$152 \leq h < 155$	21
$155 \leq h < 160$	



- (c) Use the information in the histogram to complete the table. **(2 marks)**
- (d) Use both tables and both histograms to give **two** differences between the distributions of boys' heights and girls' heights. **(2 marks)**

Question 4

9 different models of car were tested to see how long it took each car to travel 500 metres from a standing start. The times, together with the size of each engine, are shown in the table.

Model	A	B	C	D	E	F	G	H	I
Engine Size cc	1000	1200	1250	1400	1450	1600	1800	1950	2000
Time (seconds)	26	23	23	21	21	19	18	16	14

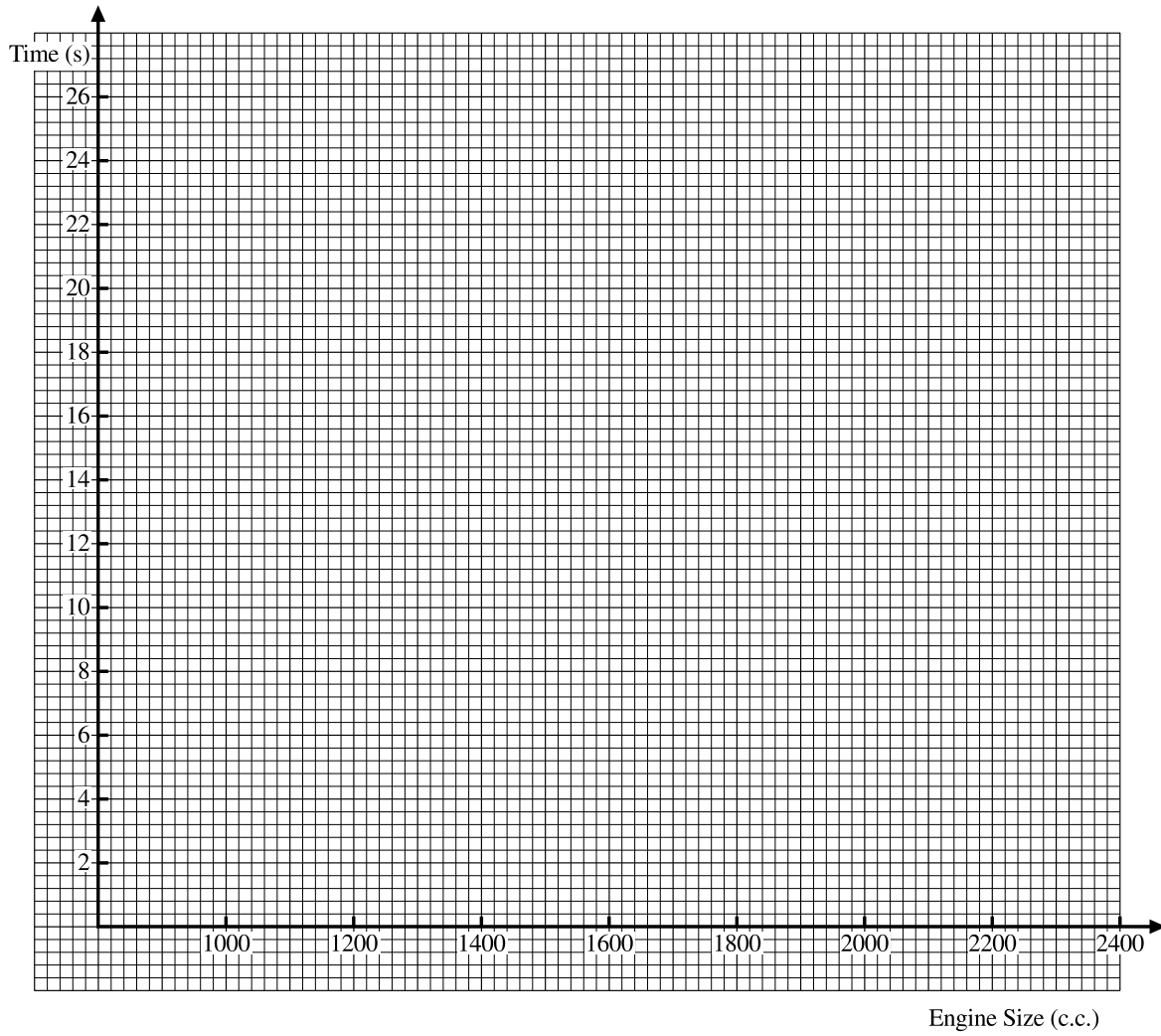
- (a) Plot these on the scatter diagram below. **(2 marks)**
- (b) Describe the relationship between the time it takes for a car to travel 500 metres and the size of its engine. **(1 mark)**
- (c) Use your scatter diagram to estimate the time taken to travel 500 metres by a car with an engine size of 1700 cc. **(1 mark)**

A model is selected at random from the above table.

- (d) Work out the probability it will have an engine size greater than 1400 cc. **(1 mark)**

Each model name is written on a different piece of paper. Each piece of paper is put in the same hat. A piece of paper is drawn at random from the hat.

- (e) Work out the probability that it will have the name of a model that has an engine size greater than 1400 cc as well as a time less than 18 seconds. **(1 mark)**



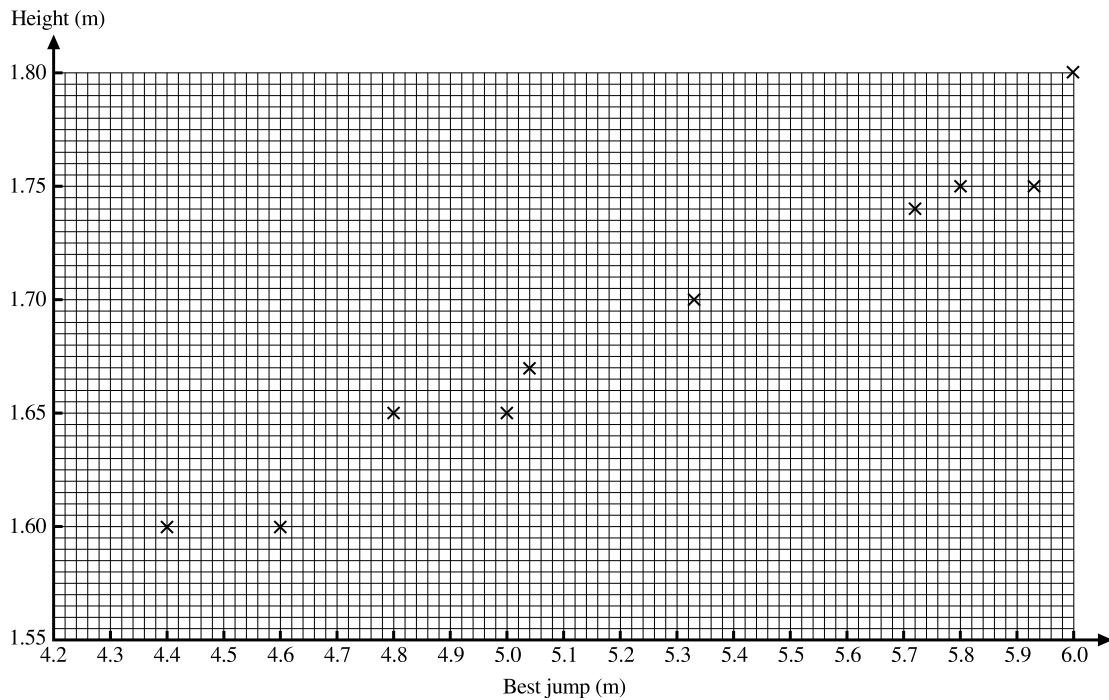
Question 5

Ten men took part in a long jump competition.

The table shows the heights of the ten men and the best jumps they made.

Best jump (m)	5.33	6.00	5.00	5.95	4.80	5.72	4.60	5.80	4.40	5.04
Height of men (m)	1.70	1.80	1.65	1.75	1.65	1.74	1.60	1.75	1.60	1.67

This information is shown in the scatter graph below.



(a) Draw a line of best fit **(2 marks)**

(b) Use your line of best fit to estimate

i) the height of a man who could make a best jump of 5.2 m.

ii) the best jump of a man of height 1.73 m. **(2 marks)**

Question 6

Fred is conducting a survey into television viewing habits.

One of the questions in his survey is

"How much television do you watch?"

His friend Sheila tells him that it is not a very good question.

Write down two ways in which Fred could improve his question.

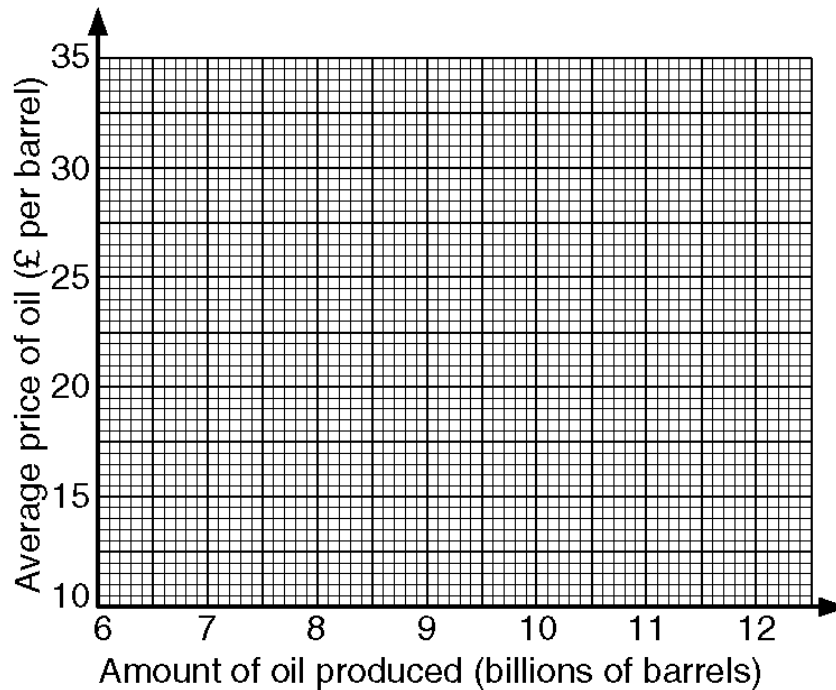
Question 7

Information about oil was recorded each year for 12 years.

The table shows the amount of oil produced (in billions of barrels) and the average price of oil (in £ per barrel).

Amount of oil produced (billions of barrels)	Average price of oil (£ per barrel)
7.0	34
11.4	13
10.8	19
11.3	12
9.6	23
8.2	3
7.7	30
10.9	12.5
8.0	28.5
9.9	13.5
9.2	26.5
9.4	15.5

- (a) Draw a scatter graph to show the information in the table.



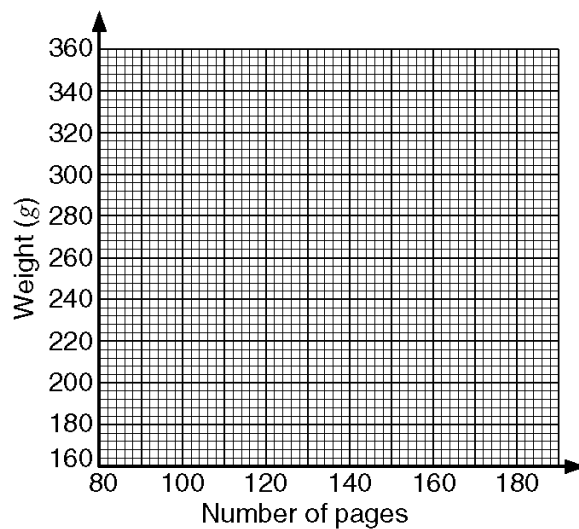
- (b) Describe the correlation between the average price of oil and the amount of oil produced.

Question 8

The table lists the weights of twelve books and the number of pages in each one.

Number of pages	Weight (g)
80	160
155	330
100	200
125	260
145	320
90	180
140	290
160	330
135	260
100	180
115	230
165	350

- (a) Draw a scatter graph to show the information in the table.

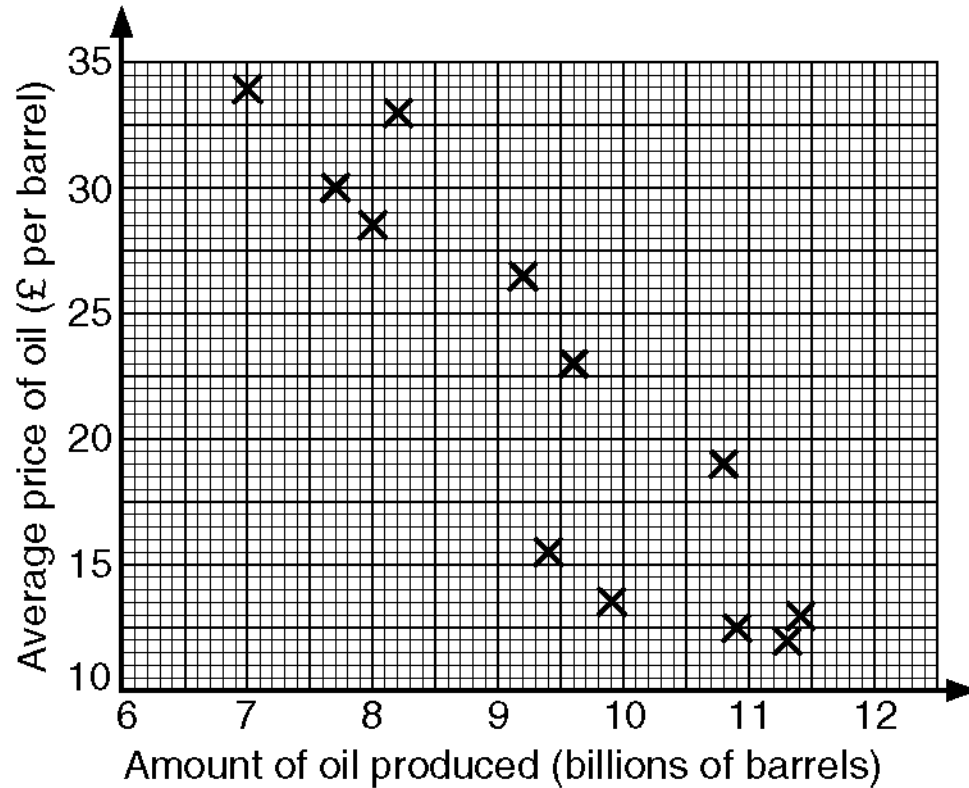


- (b) Describe the correlation between the number of pages in these books and their weights.

Question 9

Information about oil was recorded each year for 12 years.

The scatter graph shows the amount of oil produced (in billions of barrels) and # the average price of oil (in £ per barrel).



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

In another year the amount of oil produced was 10.4 billion barrels.

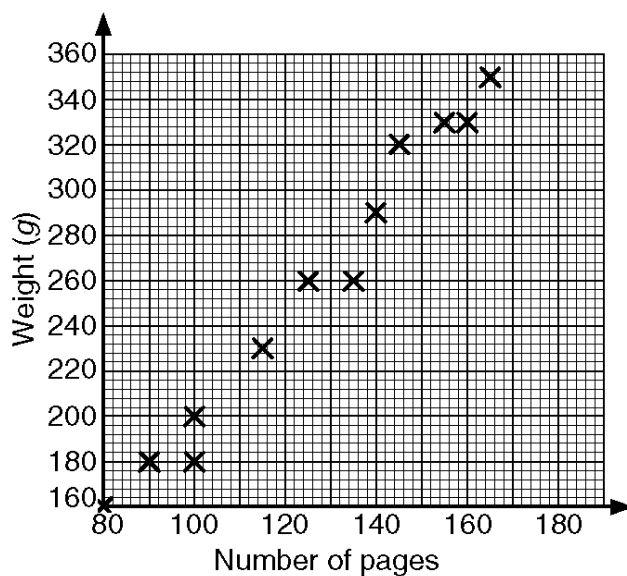
(b) Use your line of best fit to estimate the average price of oil per barrel in that year.

Question 10

The table lists the weights of twelve books and the number of pages in each one.

Number of pages	Weight (g)
80	160
155	330
100	200
125	260
145	320
145	260
90	180
140	290
160	330
135	260
100	180
115	230
165	350

This information is presented below as a scatter graph.

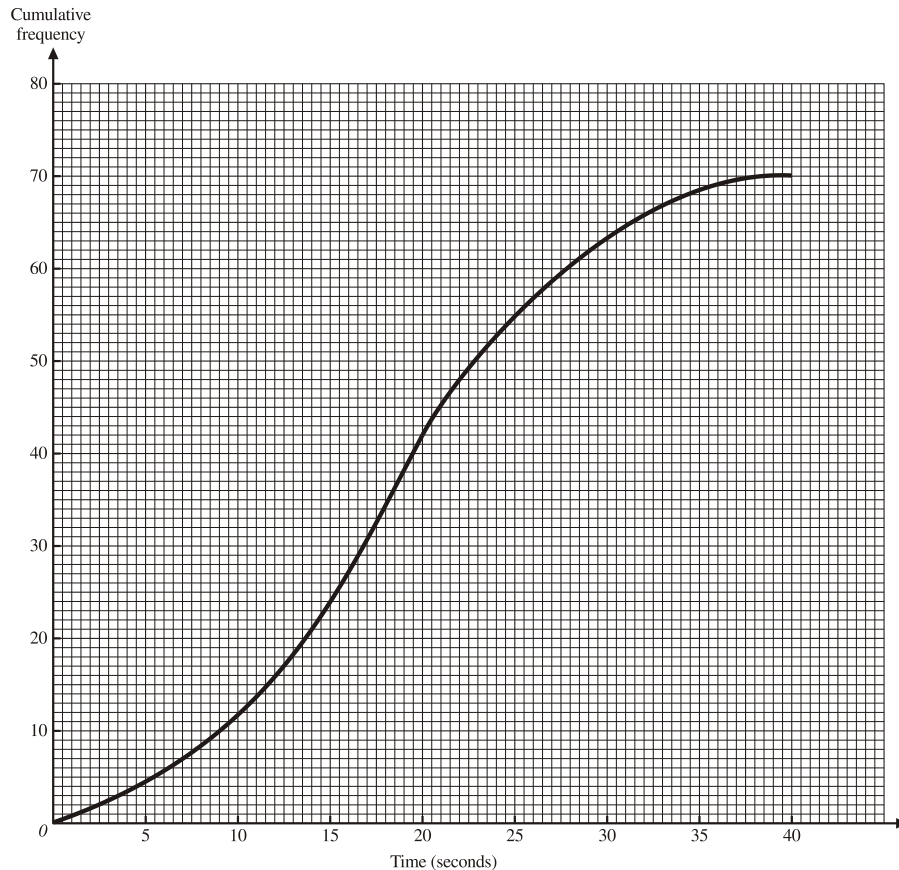


- (a) Draw a line of best fit on your scatter graph.
- (b) Use your line of best fit to estimate
- the number of pages in a book of weight 280 g,
 - the weight, in grams, of a book with 110 pages.

Question 11

The table shows the number of units of electricity used in heating a house on ten different days and the average temperature for each day.

Average temperature (°C)	6	2	0	6	3	5	10	8	9	12
Units of electricity used	28	38	41	34	31	31	22	25	23	22



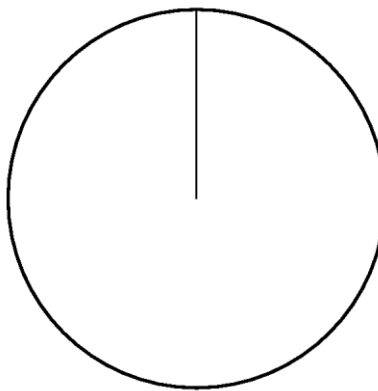
- (a) Draw a line of best fit on your scatter graph (2 marks)
- (b) Use your line of best fit to estimate (2 marks)
- i) the average temperature if 35 units of electricity are used,
 - ii) the units of electricity used if the average temperature is 7° C.

Question 12

Here is a frequency table of the animals on Mr McDonald's farm

Animal	Frequency	
Hens	30	
Sheep	80	
Cows	104	
Pigs	20	
Geese	6	

(a) Draw a fully labelled pie chart to show this data



An animal is chosen at random from Mr. McDonald's farm.

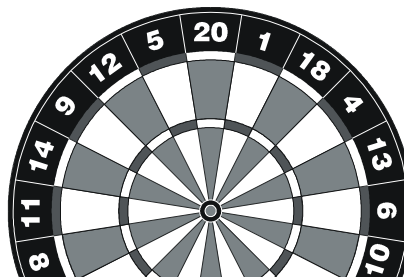
- (b) What is the probability that the animal
- i) is a pig
 - ii) is a horse
 - iii) has four legs?

Question 13

75 boys took part in a darts competition.

Each boy threw darts until he hit the centre of the dartboard.

The number of darts thrown by the boys are grouped in this frequency table.



Number of darts thrown	Frequency		
1 to 5	10		
6 to 10	17		
11 to 15	12		
16 to 20	4		
21 to 25	12		
26 to 30	20		

(a) Work out the class interval which contains the median. **(2 marks)**

(b) Work out an estimate for the mean number of darts thrown by each boy. **(4 marks)**

Question 14

Mr Hulme chose 10 boys and 10 girls at random from his school.
He counted the numbers of different vowels in their first names.
This table shows the results.

Number of different vowels in first name	One	Two	Three	Four	Five
Number of boys	3	4	2	1	0
Number of girls	2	3	4	0	1

There are 1000 pupils in the school.
There are 480 boys and 520 girls.

Estimate the number of pupils in the school who have exactly three different vowels in their first names. **(4 marks)**

Question 15

The table shows the number of students in three groups attending Maths City High School last Monday. No student belonged to more than one group.

Group	Number of students
<i>A</i>	135
<i>B</i>	225
<i>C</i>	200

Mrs Allen carried out a survey about the students' travelling times from home to school last Monday.

Mrs Allen worked out that

- the mean time for Group *A* students was 24 minutes,
- the mean time for Group *B* students was 32 minutes,
- the mean time for Group *C* students was the same as the mean time for all 560 students.

(a) Work out the mean time for all 560 students.

..... minutes
(4 marks)

Mrs Allen interviewed some of these students.

She used a stratified sample of 50 students according to each group.

(b) Work out the number of students from each group which should have been in her sample of 50.

Group *A*

Group *B*

Group *C*

(3 marks)

Question 16

Jason grows potatoes.

He weighed 100 potatoes and recorded the weights to the nearest gram.

The table shows information about the weights (w) of the 100 potatoes.

Weight (w) grams	Frequency		
$0 \leq w < 20$	0		
$20 \leq w < 40$	18		
$40 \leq w < 60$	28		
$60 \leq w < 80$	25		
$80 \leq w < 100$	19		
$100 \leq w < 120$	10		

(a) Work out an estimate for the mean weight of these potatoes.

..... g
(4 marks)

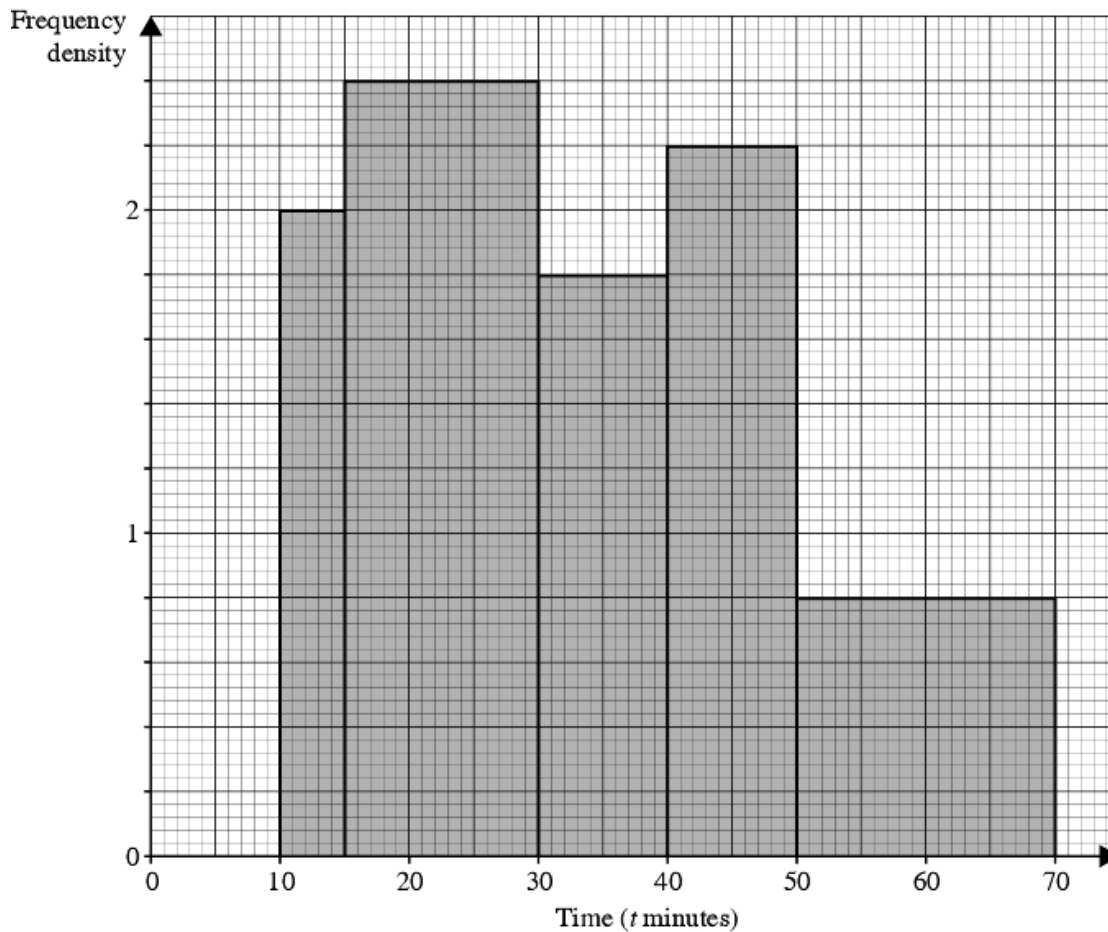
(b) Find the class interval that contains the median.

(2 marks)

Question 17

A teacher asked some year 10 students how long they spent doing homework each night.

The histogram was drawn from this information.



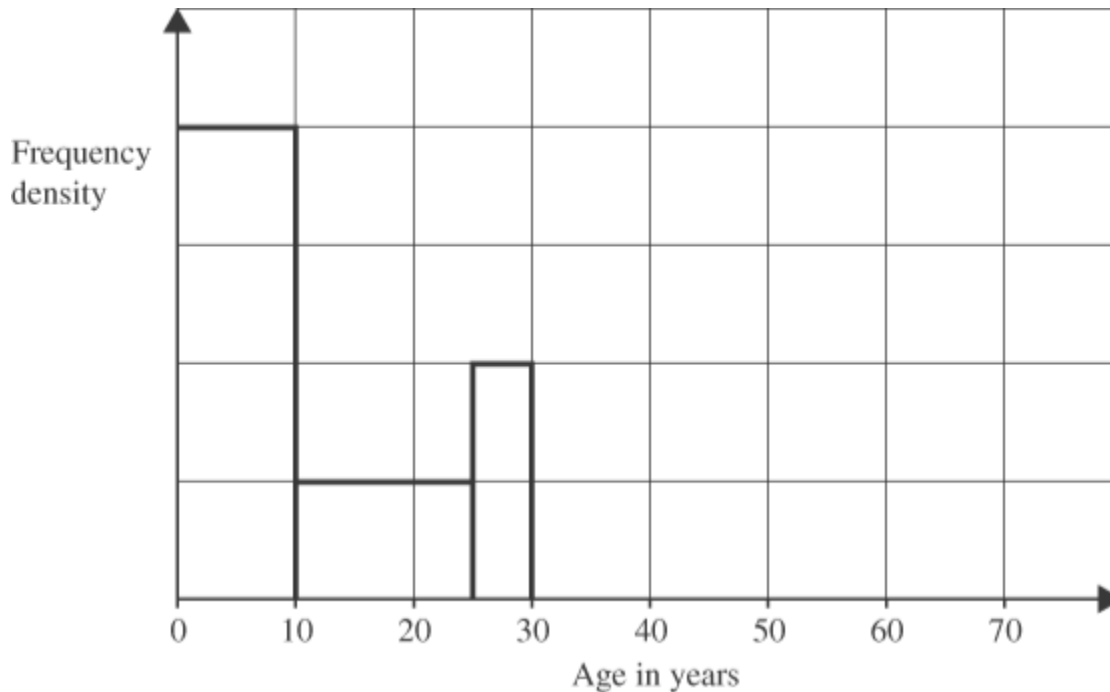
Use the histogram to complete the table.

Time (t minutes)	Frequency
$10 \leq t < 15$	10
$15 \leq t < 30$	
$30 \leq t < 40$	
$40 \leq t < 50$	
$50 \leq t < 70$	

(2 marks)

Question 18

The incomplete table and histogram give some information about the ages of the people who live in a village.



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

Age(x) in years	Frequency
$0 < x \leq 10$	160
$10 < x \leq 25$	
$25 < x \leq 30$	
$30 < x \leq 40$	100
$40 < x \leq 70$	120

(2 marks)

(b) Complete the histogram.

(2 marks)

Question 19

The table shows the number of students in each of the four Year 11 maths classes in a school.

Maths class	Number of pupils
Class 1	35
Class 2	30
Class 3	20
Class 4	10

A sample of size 30 is to be taken from Year 11.

Omar suggests that 3 of the classes are chosen at random and 10 students selected at random from each class.

(a) Would this method give a random sample? **Explain** your answer.

.....
.....

(1 mark)

Nesta suggests a stratified sample of size 30 from the whole of Year 11 according to each maths class.

(b) How many students from Class 1 should be in the sample?

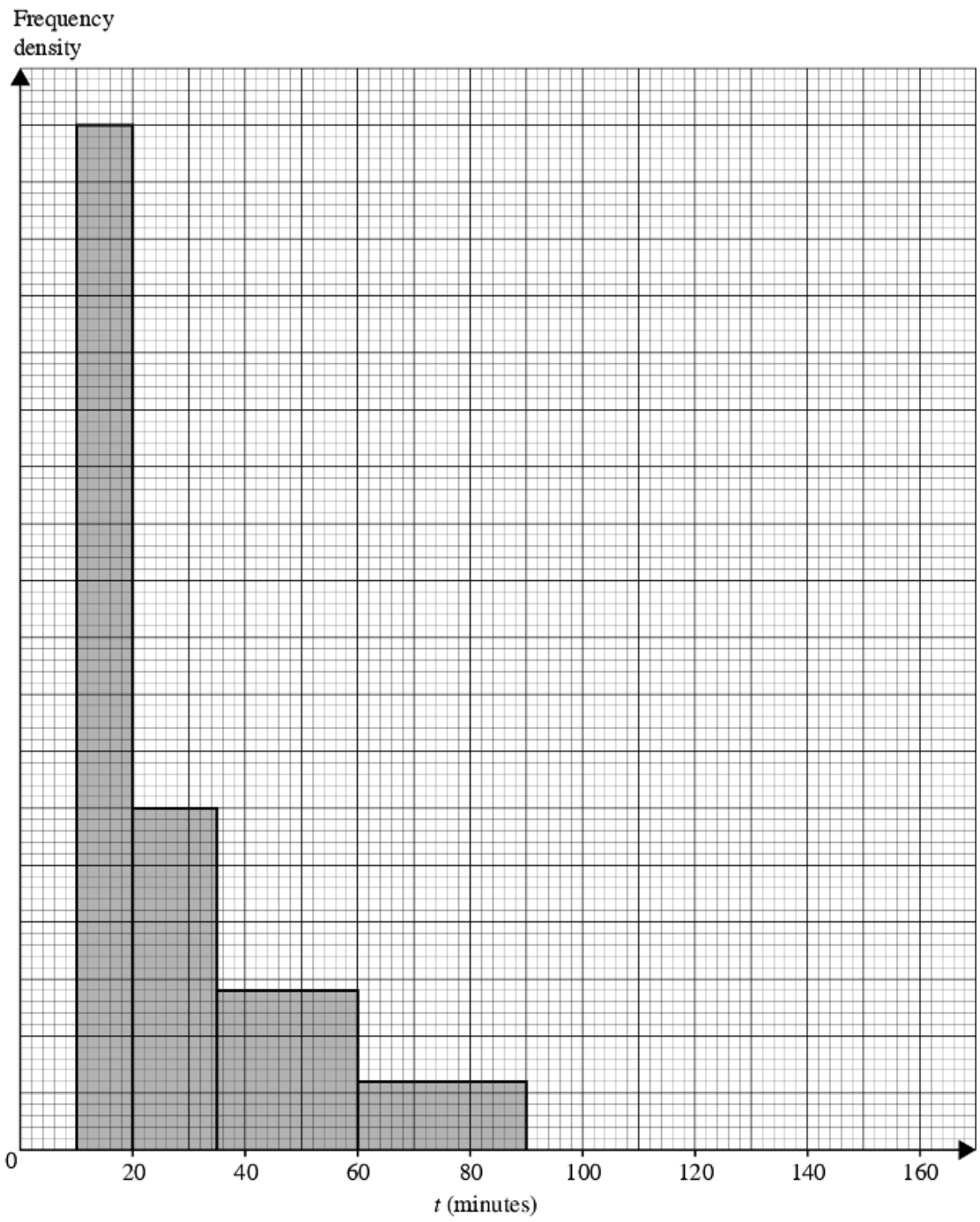
.....
(2 marks)

Question 20

A record was kept of the length of time, t minutes, that computer users were connected to an internet server during a 150minute period.

Time (t) minutes	Frequency
$0 < t \leq 5$	40
$5 < t \leq 10$	150
$10 < t \leq 20$	
$20 < t \leq 35$	225
$35 < t \leq 60$	
$60 < t \leq 90$	
$90 < t \leq 150$	60

- (a) Use the information in the histogram to complete the frequency table.
(3 marks)
- (b) Use the information in the frequency table to complete the histogram.
(3 marks)



(3 marks)