Mock topics 21-29 test Name: WORKED SOLUTION

Q1.

The table shows information about the times taken by 100 people in a fun run.

Time (t minutes)	Frequency
$20 < t \leqslant 30$	4
$30 < t \leqslant 40$	16
$40 < t \leqslant 50$	36
$50 < t \leqslant 60$	24
$60 < t \leqslant 70$	14
$70 < t \leqslant 80$	6

(a) Complete the cumulative frequency table for this information.

Time (t minutes)	Cumulative frequency
$20 < t \leqslant 30$	4
$20 < t \leqslant 40$	20
$20 < t \leqslant 50$	56
$20 < t \leqslant 60$	80
$20 < t \leqslant 70$	94
$20 < t \leqslant 80$	100

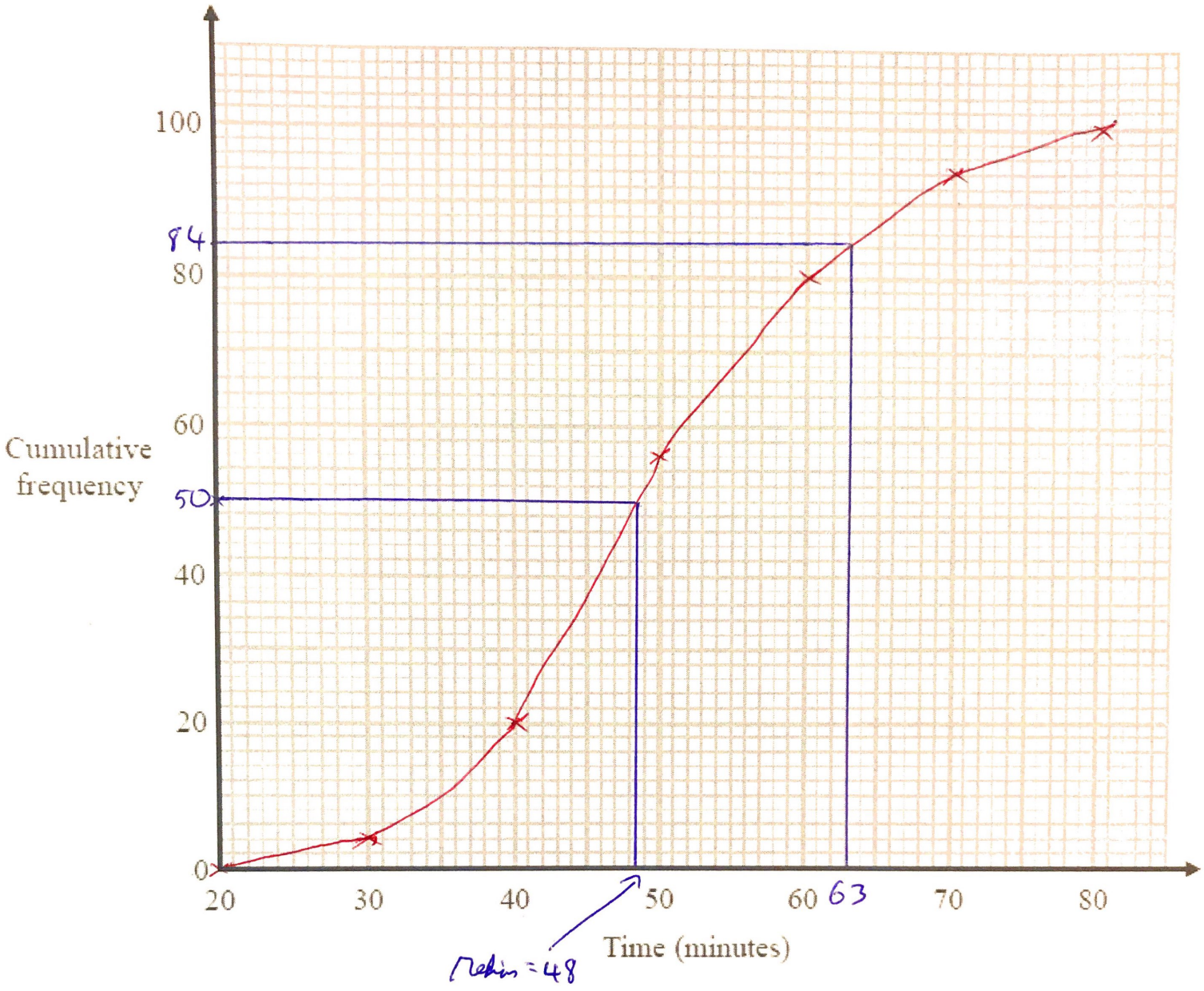
4 + 16

20 + 36

(1)

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

(2)



(c) Use your graph to find an estimate for the median time.

48 minutes

(1)

(d) Use your graph to find an estimate for the number of people who took longer than 63 minutes.

100 − 84

16

(2)

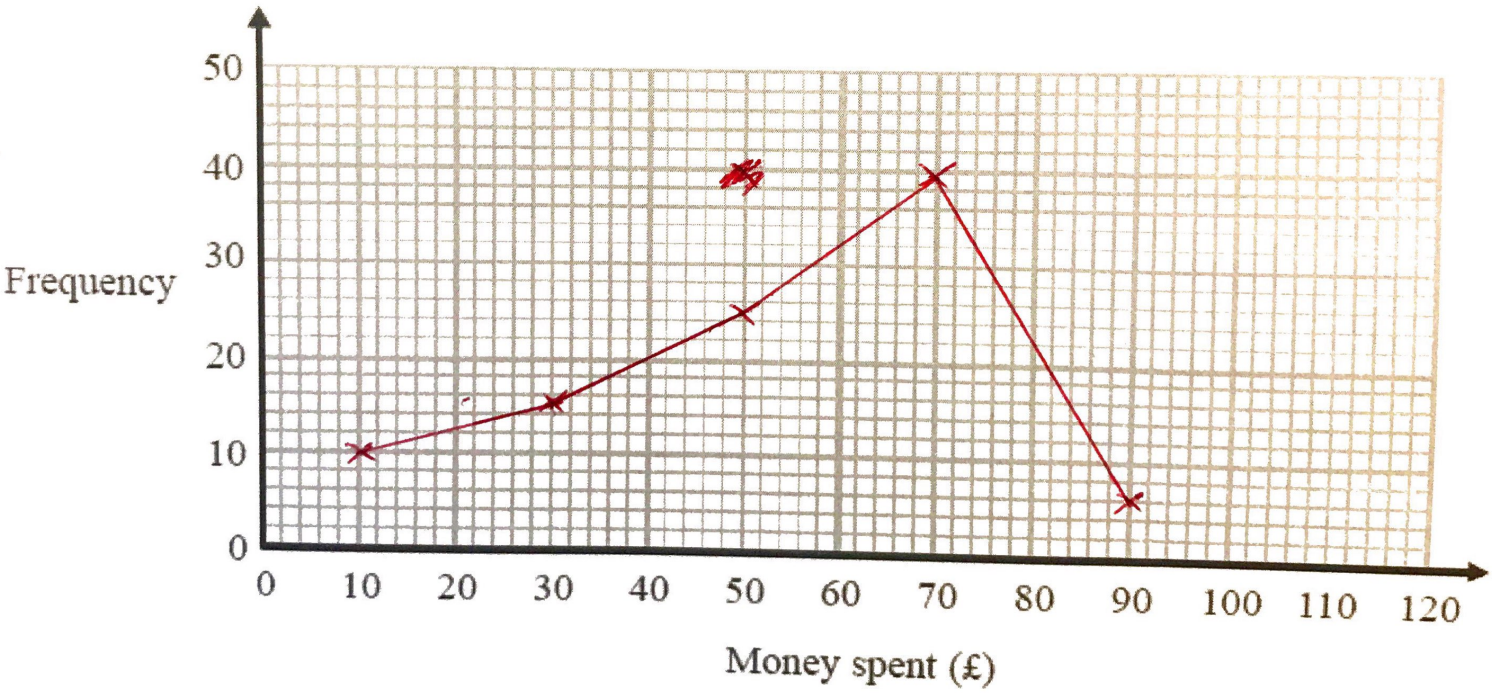
(Total for question = 6 marks)

Q2.

The table gives information about the money, £A, some people spent on an internet site one day.

Money spent (£A)	Frequency
$0 < A \leqslant 20$	10
$20 < A \leqslant 40$	15
$40 < A \leqslant 60$	25
$60 < A \leqslant 80$	40
$80 < A \leqslant 100$	6

(a) On the grid, draw a frequency polygon for this information.



(2)

(b) Write down the modal class interval.

$60 < A \leq 80$

(1)

(Total for question = 3 marks)

Q3.

Bob asked each of 40 friends how many minutes they took to get to work.

The table shows some information about his results.

Time taken (m minutes)	Frequency	$m \times f$
$0 < m \leq 10$	3	15
$10 < m \leq 20$	8	120
$20 < m \leq 30$	11	275
$30 < m \leq 40$	9	315
$40 < m \leq 50$	9	405
	40	1130

Work out an estimate for the mean time taken.

$$\frac{1130}{40} = 28.25$$

28.25 minutes

(Total for Question is 4 marks)

Q4.

The table shows some information about the prices of 64 secondhand cars that are for sale.

Price (£x)	Frequency (f)	Midpoint (x)	fx
$0 < x \leqslant 2000$	8	1000	8000
$2000 < x \leqslant 4000$	14	3000	42000
$4000 < x \leqslant 6000$	28	5000	140,000
$6000 < x \leqslant 8000$	10	7000	70,000
$8000 < x \leqslant 10000$	4	9000	36,000
	64		296000

(a) Calculate an estimate for the mean price.

$$\frac{296000}{64} = 4625$$

£ 4,625

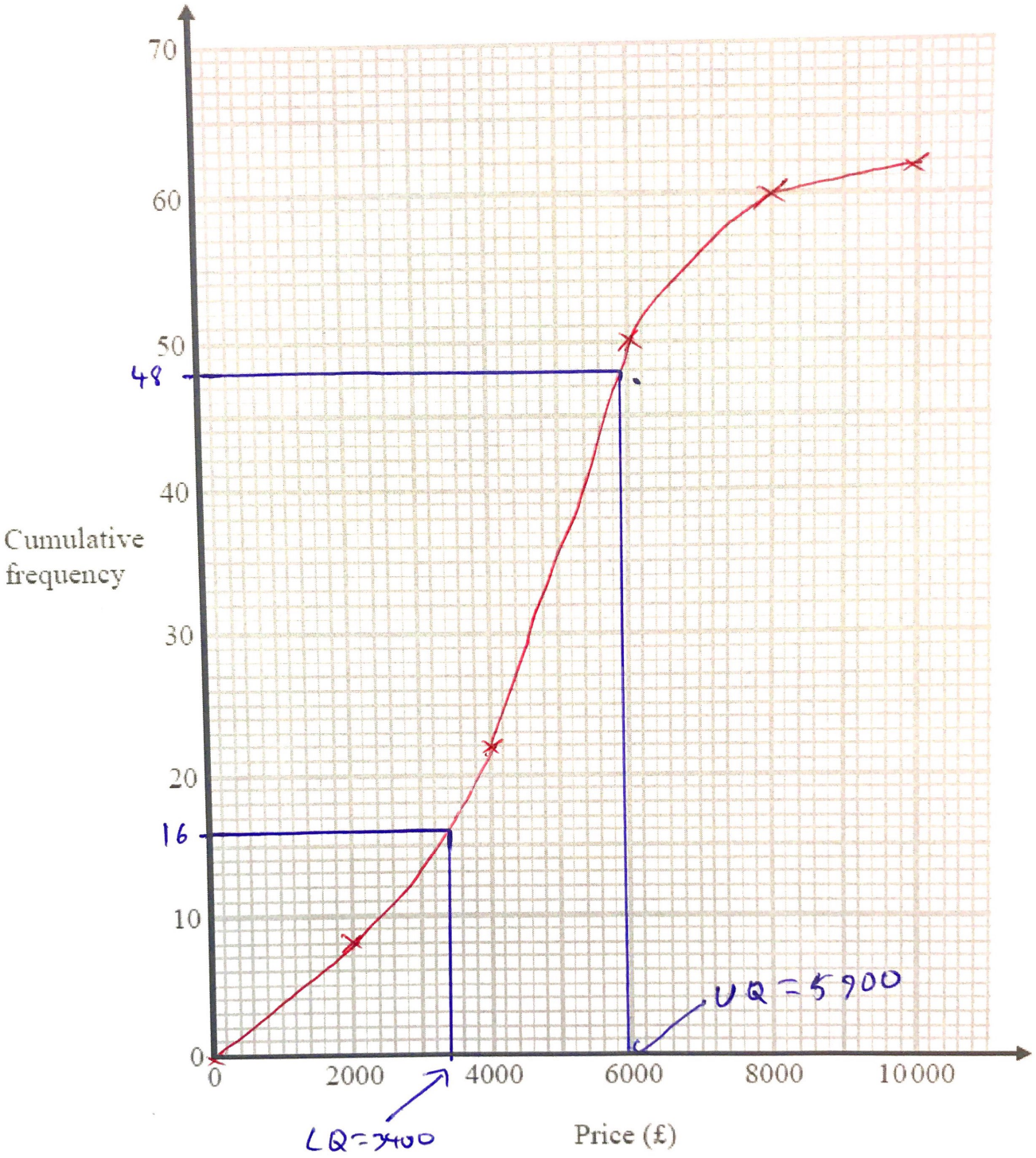
(4)

(b) Complete the cumulative frequency table.

Price (£x)	Cumulative frequency
$0 < x \leqslant 2000$	8
$0 < x \leqslant 4000$	22
$0 < x \leqslant 6000$	50
$0 < x \leqslant 8000$	60
$0 < x \leqslant 10000$	64

(1)

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



(2)

(d) Find an estimate for the interquartile range.

5900 - 3400

£ 2,500

(2)

(Total for question = 9 marks)

Q5.

The table gives information about the numbers of badges gained by the younger girls in a Guide group.

Number of badges (x)	Frequency (f)	fx
0	2	0
1	8	8
2	4	8
3	3	9
4	5	20
5	3	15
	25	60

(a) Write down the mode.

Number with highest frequency

1

(1)

(b) Work out the mean number of badges gained by these girls.

$60 \div 25$

2.4

(3)

There are 15 older girls in the Guide group.
The mean number of badges gained by these 15 older girls is 4.4

Total girls : 40

(c) Work out the mean number of badges gained by all the girls in the Guide group.

Total earned by younger girls : 60

Total earned by older girls : $15 \times 4.4 = 66$

$$\text{Mean} = \frac{126}{40} = 3.15$$

3.15

(3)

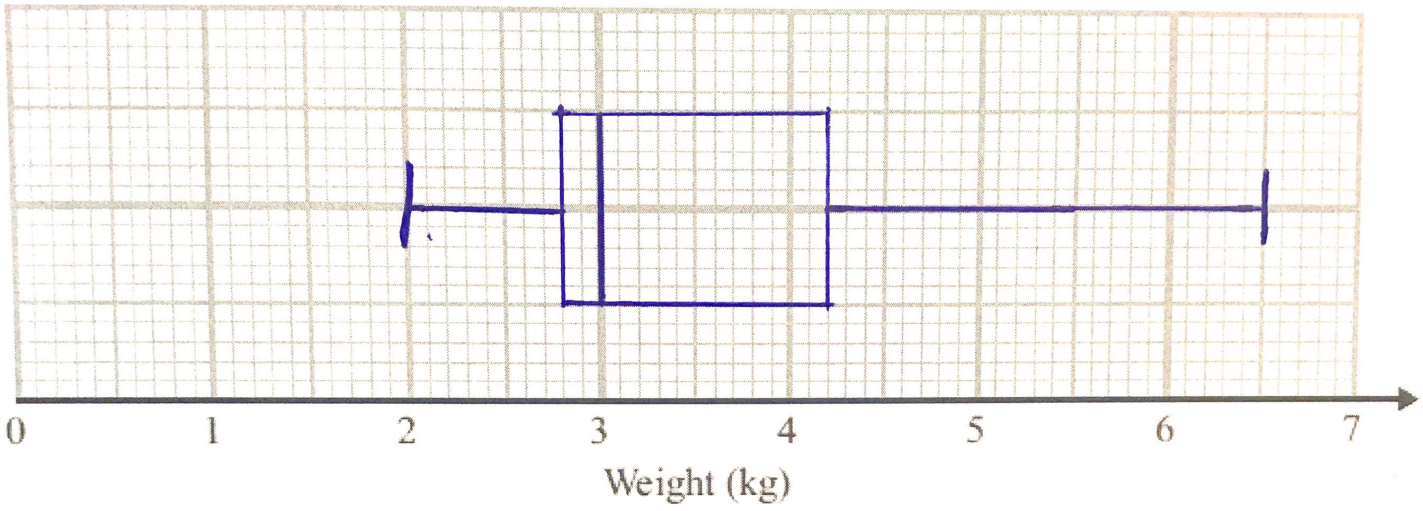
(Total for question = 7 marks)

Q6.

The table gives some information about the weights of 60 babies.

Lowest	2.0 kg
Highest	6.5 kg
Lower quartile	2.8 kg
Upper quartile	4.2 kg
Median	3.0 kg

(a) Draw a box plot to show this information.



(2)

There are 60 babies.

(b) Work out an estimate for the number of these babies with a weight greater than 2.8 kg.

LQ

75% of 60 = 45

.....

(2)

(Total for Question is 4 marks)

Q7.

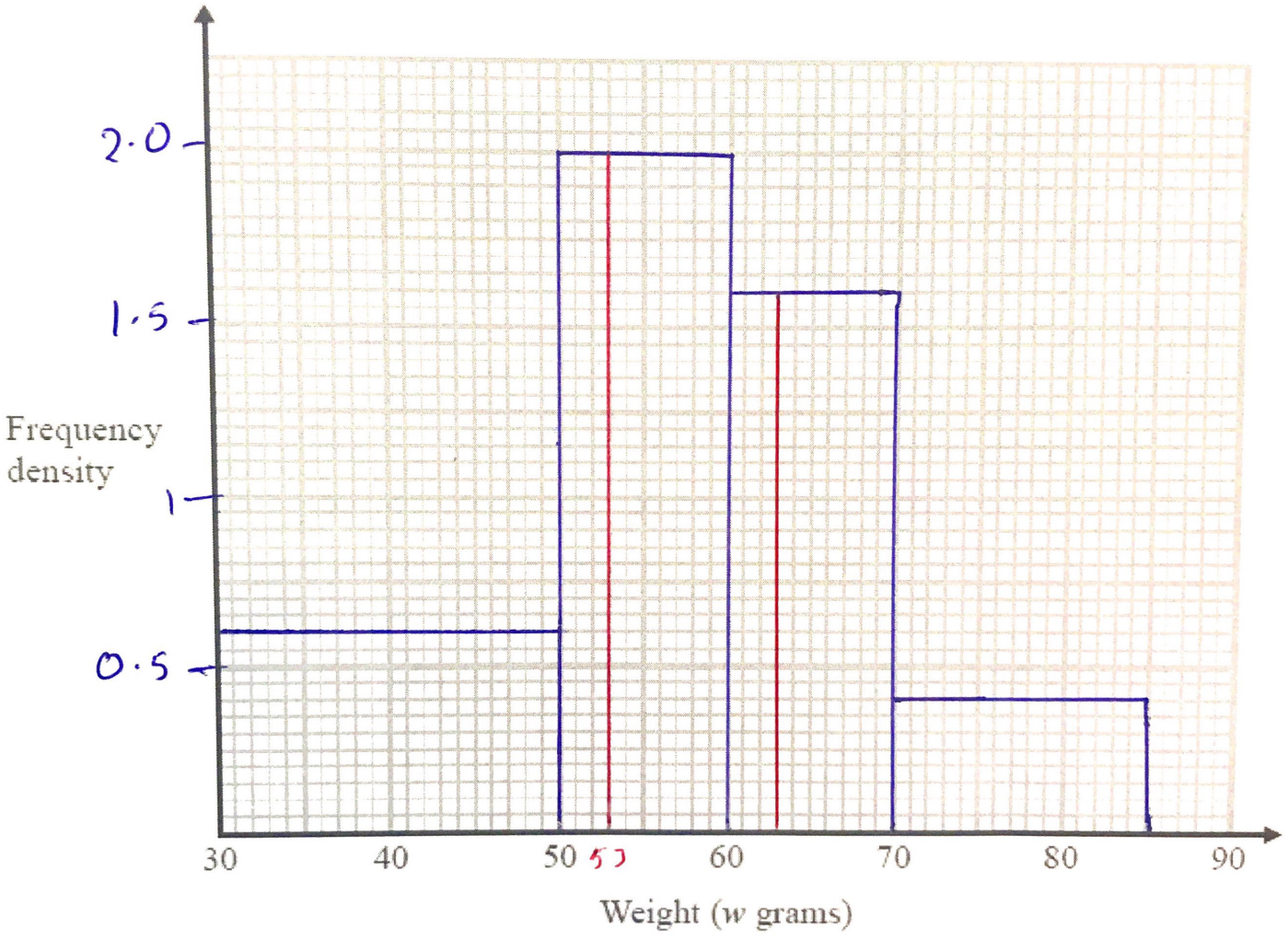
Billy keeps chickens.

$FD = \frac{\text{Frequency}}{\text{Class width}}$

The table shows information about the weights, in grams, of eggs produced by the chickens.

Weight (w grams)	$30 < w \leqslant 50$	$50 < w \leqslant 60$	$60 < w \leqslant 70$	$70 < w \leqslant 85$
Number of eggs	12	20	17	6
FD	0.6	2	1.7	0.4

(a) On the grid, draw a histogram for this information.



(3)

Medium eggs weigh between 53grams and 63grams.

(b) Work out an estimate for the number of medium eggs produced.

$\frac{7}{10} \times 20 + \frac{3}{10} \times 17 = 19.1 \approx 19$

19

(3)

(Total for question = 6 marks)

Q8.

(a) Explain what is meant by a stratified sample.

A sample is the same proportions as the population

(1)

The table shows information about the ages of the people living in a village.

Age group	Number of people
Under 21	72
21–40	90
41–60	123
Over 60	314

599

Mrs Parrish carries out a survey of these people.
She uses a sample size of 50 people stratified by age group.

(b) Work out the number of people over 60 years of age in the sample.

$\frac{314}{599} \times 50 = 26.2 \approx 26$

26

(2)

(Total for Question is 3 marks)

Q9.

A set of tyres normally costs £500
In a sale there is a 30% discount.

Work out the sale price of the set of tyres.

New price 70% of original

0.7×500

£ 350

(Total for Question is 3 marks)

Q10.

30% of the people at a concert are female.
1295 of the people at the concert are male. 70% are male

Work out the number of people at the concert who are female.

$1295 \div 7 = 10\%$ of total

$185 = 10\%$ of total

$1850 = 100\%$ of total

1850

(Total for question = 3 marks)

Q11.

Claire is making a loaf of bread.
A loaf of bread loses 12% of its weight when it is baked.

Claire wants the baked loaf of bread to weigh 1.1 kg.

Work out the weight of the loaf of bread before it is baked.

$1.1\text{kg} = 88\%$ of original weight

Original $= 1.1 \div 0.88$

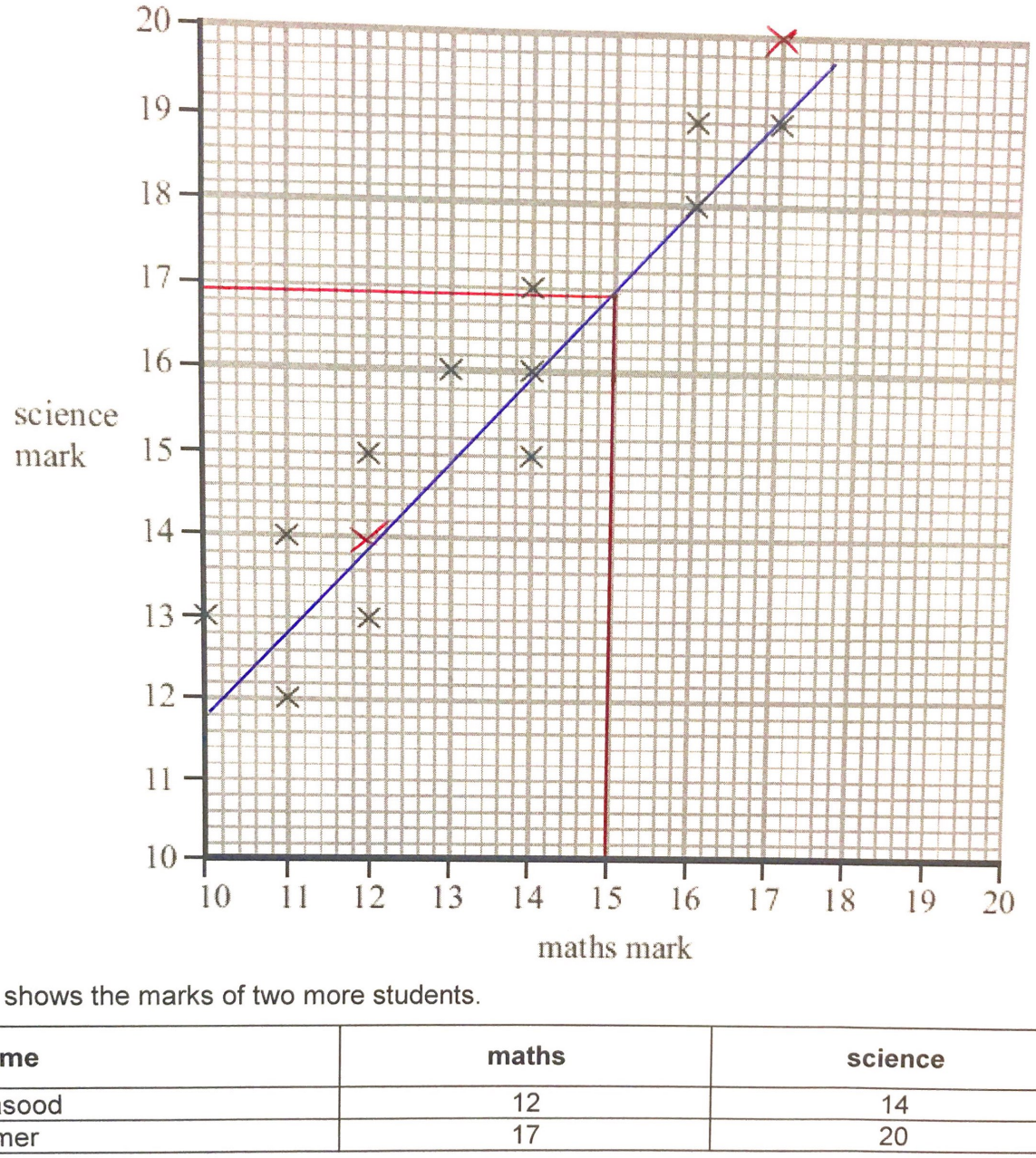
$=$

1.25 kg

(Total for question = 3 marks)

Q12.

Mr Kent's students did a maths test and a science test.
The scatter graph shows the marks of 12 of these students.



The table shows the marks of two more students.

Name	maths	science
Masood	12	14
Nimer	17	20

(a) Show this information on the scatter graph.

(1)

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

Positive

(1)

David did the maths test.
He was absent for the science test.

David's mark in the maths test was 15

Line of best fit needed to gain full marks or estimate

(c) Estimate a science mark for David.

17

(2)

(Total for Question is 4 marks)

Q13.

Mary plays a game of throwing a ball at a target.

The table shows information about the probability of each possible score.

Score	0	1	2	3	4	5
Probability	0.09	x	$3x$	0.16	0.21	0.30

Mary is 3 times as likely to score 2 points than to score 1 point.

(a) Work out the value of x.

$0.09 + x + 3x + 0.16 + 0.21 + 0.3 = 1$

$4x = 0.24$

$x = 0.06$

.....

(3)

Mary plays the game twice.

(b) Work out the probability of Mary scoring a total of 8

$(3, 5)$ OR $(4, 4)$ OR $(5, 3)$

$0.18 \times 0.3 + 0.21 \times 0.21 + 0.3 \times 0.18$

$= 0.1401$

.....

(3)

(Total for Question is 6 marks)

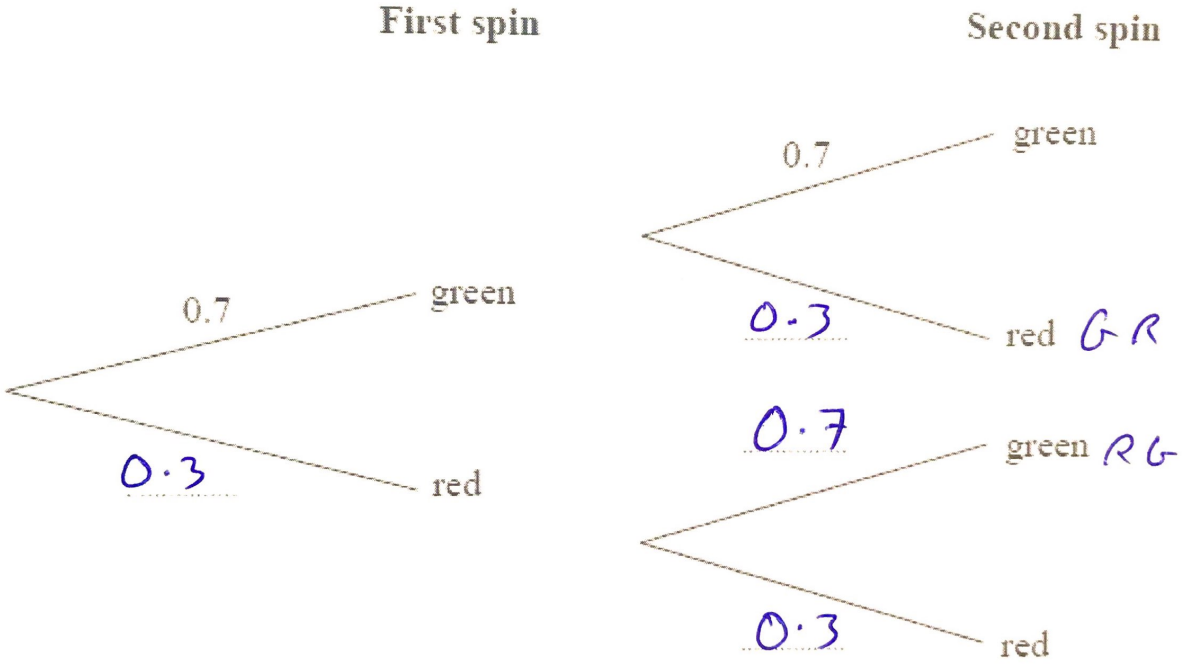
Q14.

Louise makes a spinner.

The spinner can land on green or on red.
The probability that the spinner will land on green is 0.7

Louise spins the spinner twice.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that the spinner lands on two different colours.

GR + RG

= 0.7 × 0.3 + 0.3 × 0.7

0.42

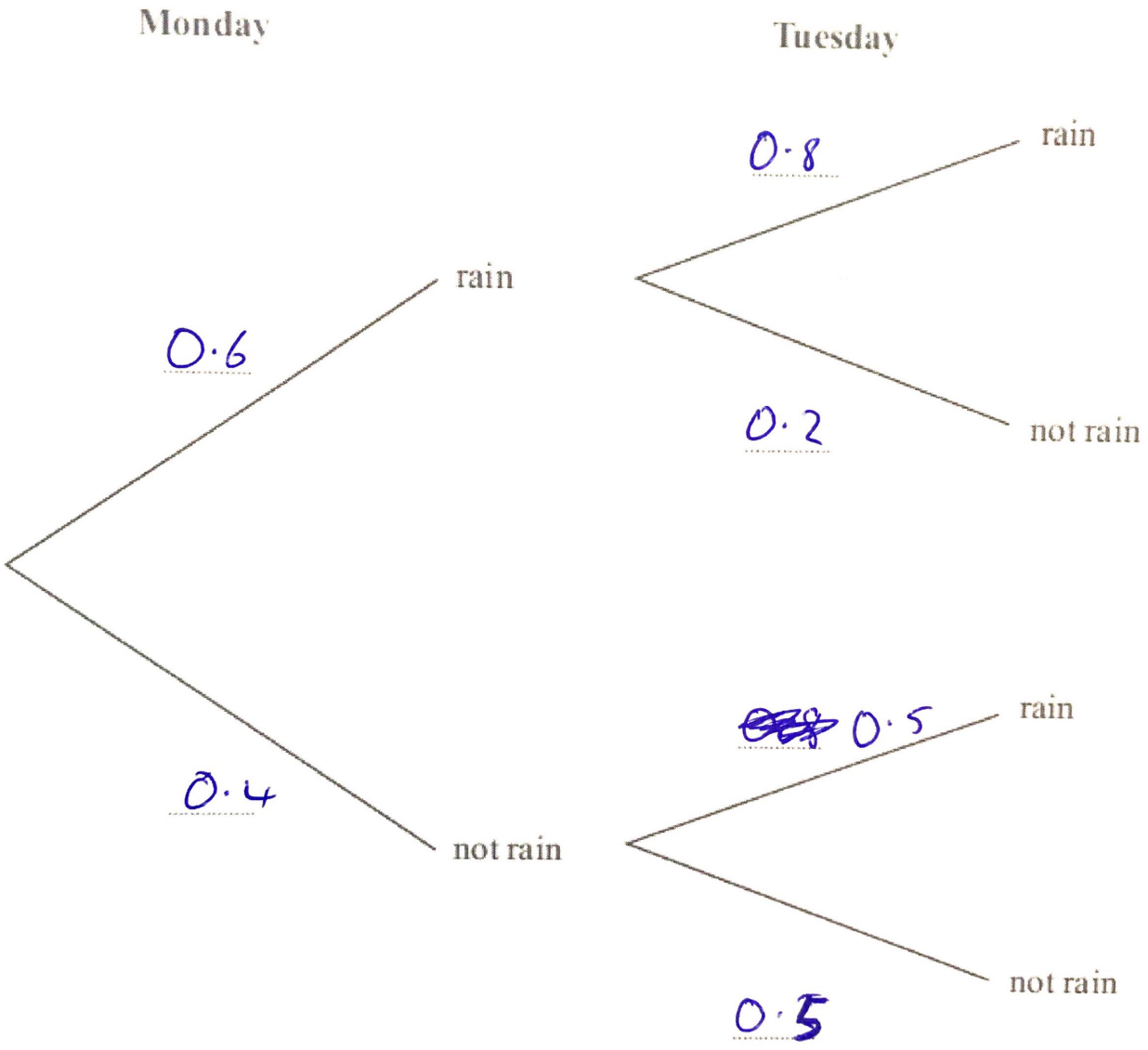
(3)

(Total for question = 5 marks)

Q15.

The probability that it will rain on Monday is 0.6

When it rains on Monday, the probability that it will rain on Tuesday is 0.8
When it does **not** rain on Monday, the probability that it will rain on Tuesday is 0.5



(a) Complete the probability tree diagram.

(2)

(b) Work out the probability that it will rain on both Monday and Tuesday.

$0 \cdot 6 \times 0 \cdot 8 = 0 \cdot 48$

(2)

(c) Work out the probability that it will rain on at least one of the two days.

$0 \cdot 6 \times 0 \cdot 8 + 0 \cdot 6 \times 0 \cdot 2 + 0 \cdot 4 \times 0 \cdot 5$

$= 0 \cdot 8$

(3)

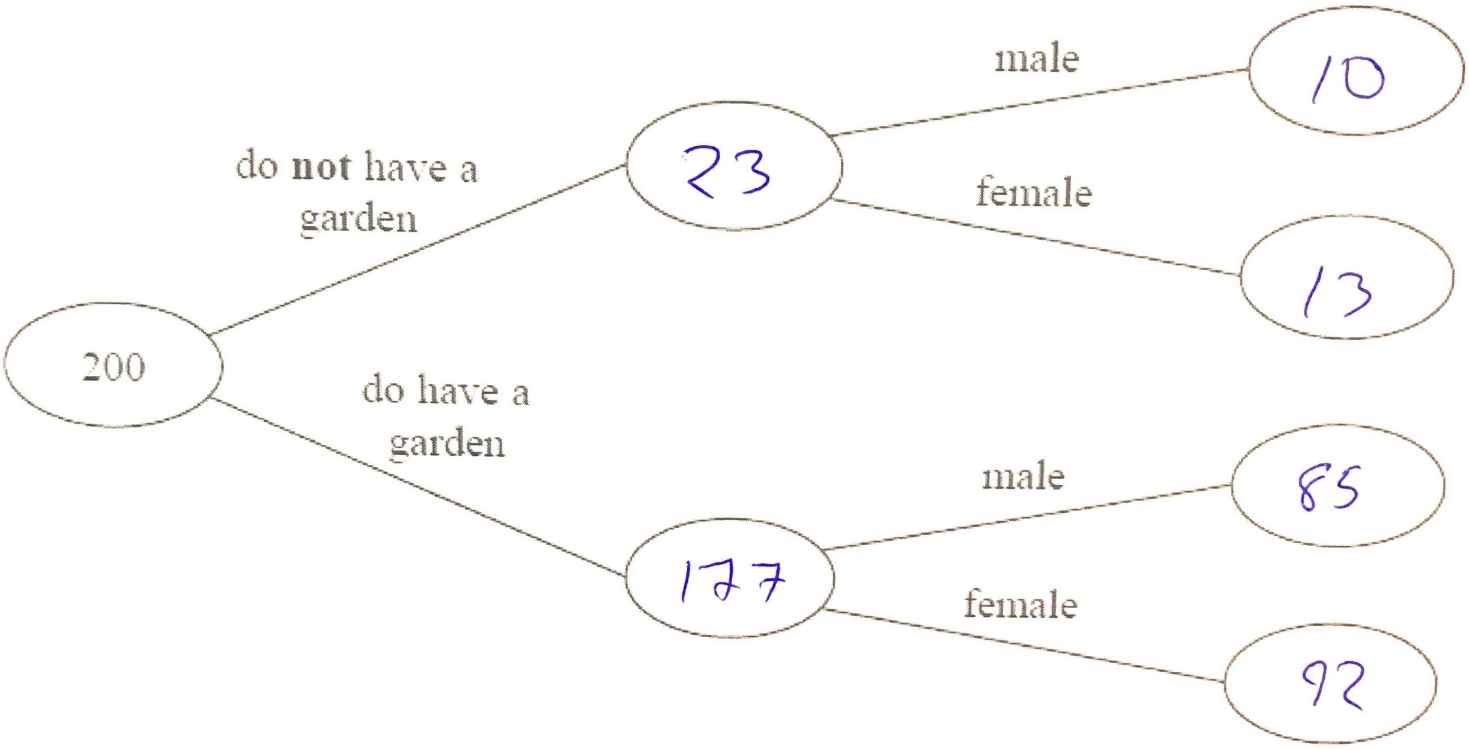
(Total for Question is 7 marks)

Q16.

200 people live in a village.

23 people do **not** have a garden.
10 males do **not** have a garden.
95 people are male.

(a) Use this information to complete the frequency tree.



(3)

One of the people who does **not** have a garden is chosen at random.

(b) Write down the probability that this person is female.

$\frac{13}{23}$

.....

(2)

(Total for question = 5 marks)