

Write your name here

Surname

Other names

**Pearson**  
**Edexcel GCSE**

Centre Number

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Candidate Number

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# Mathematics B

## Unit 1: Statistics and Probability (Calculator)

**Higher Tier**

Thursday 26 May 2016– Morning

**Time: 1 hour 15 minutes**

Paper Reference

**5MB1H/01**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.142 unless the question instructs otherwise.



### Information

- The total mark for this paper is 60
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (\*) are ones where the quality of your written communication will be assessed.

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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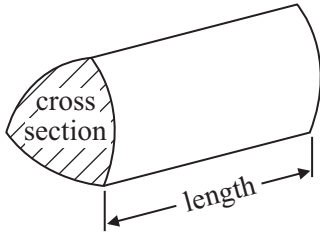
**PEARSON**

## GCSE Mathematics 2MB01

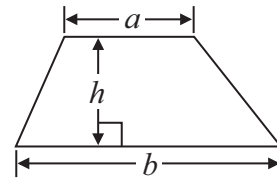
Formulae: Higher Tier

**You must not write on this formulae page.  
Anything you write on this formulae page will gain NO credit.**

**Volume of prism** = area of cross section  $\times$  length

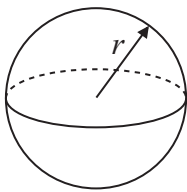


**Area of trapezium** =  $\frac{1}{2} (a + b)h$



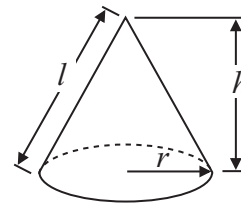
**Volume of sphere** =  $\frac{4}{3} \pi r^3$

**Surface area of sphere** =  $4\pi r^2$

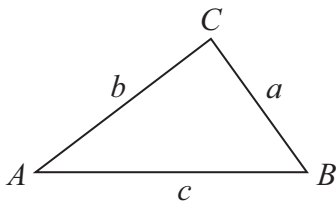


**Volume of cone** =  $\frac{1}{3} \pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**In any triangle ABC**



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$  where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2} ab \sin C$



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**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all stages in your working.**

- 1** Zack is doing a survey to find out how much time students spend listening to music. He is going to ask 10 of the boys who play in a school band.

This may **not** be a good sample for Zack's survey.

- (a) Give a reason why.

(1)

Zack is going to use a questionnaire to find out how much time students spend listening to music.

- (b) Design a suitable question for Zack to use on his questionnaire.

(2)

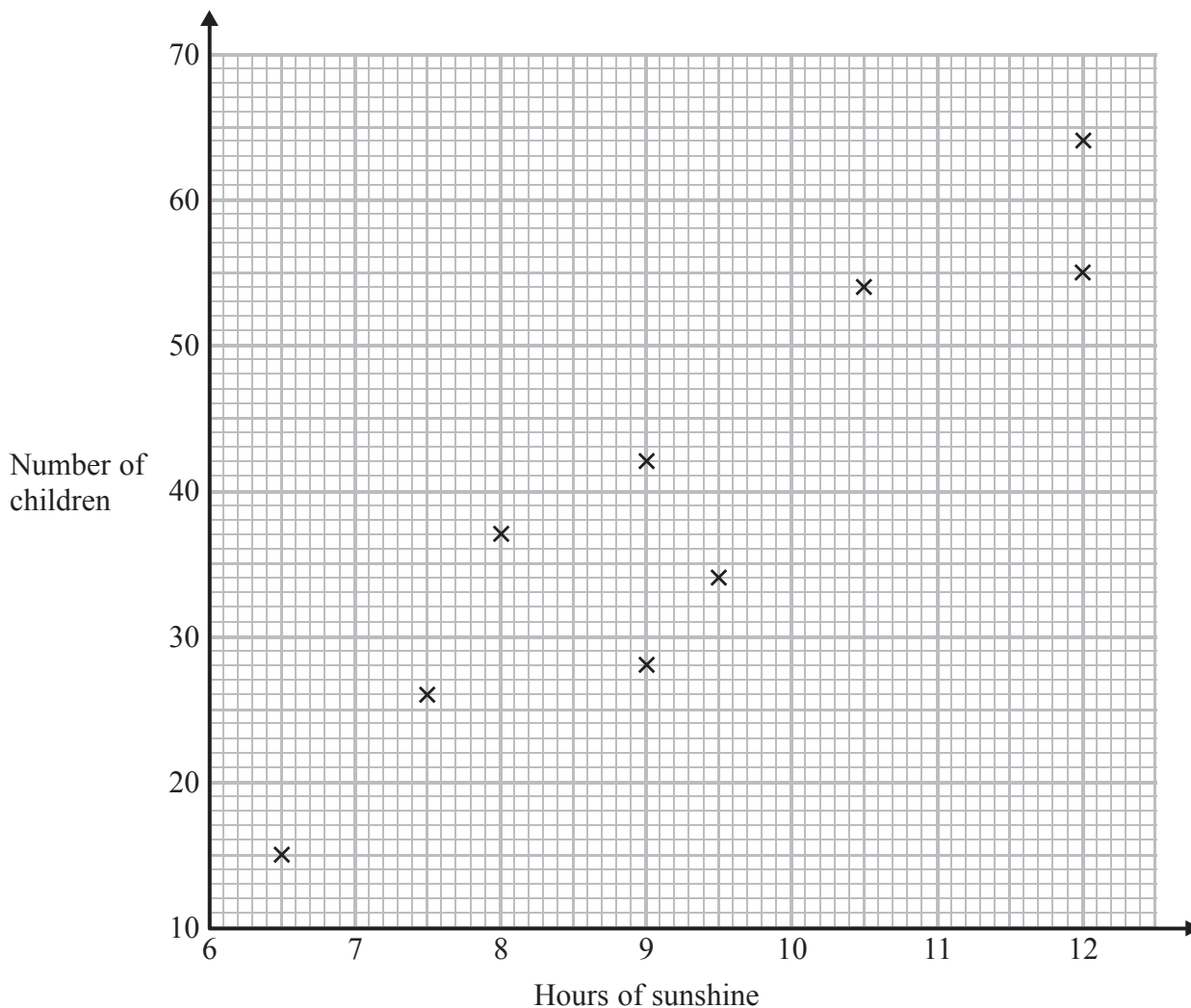
**(Total for Question 1 is 3 marks)**



2 Sally looks after a children's paddling pool in a park.

Each day, Sally records the number of hours of sunshine and the number of children who use the paddling pool.

The scatter graph shows this information.



(a) Describe the correlation between the number of children who use the paddling pool and the number of hours of sunshine.

.....  
(1)

One day there were 10 hours of sunshine.

(b) Estimate how many children used the paddling pool.

.....  
(2)

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On another day, there were 6.5 hours of sunshine and 45 children used the pool.

(c) (i) Show this information on the scatter graph.

This point is isolated on the scatter graph.

(ii) Explain what may have happened on this day.

(2)

**(Total for Question 2 is 5 marks)**

**3** Alex is  $x$  cm tall.

Bob is 10 cm taller than Alex.

Cath is 4 cm shorter than Alex.

Write an expression, in terms of  $x$ , for the mean of their heights in centimetres.

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

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P 4 6 5 5 2 R A 0 5 1 6

4 A piece of wood has a width of 37 millimetres, correct to the nearest millimetre.

(a) Write down the least possible width of the piece of wood.

..... mm  
(1)

(b) Write down the greatest possible width of the piece of wood.

..... mm  
(1)

**(Total for Question 4 is 2 marks)**

5 A factory produces light bulbs.

The probability of a light bulb being faulty is 0.03

One day the factory produces 1800 light bulbs.

Work out an estimate for the number of these light bulbs that are **not** faulty.

.....  
**(Total for Question 5 is 3 marks)**

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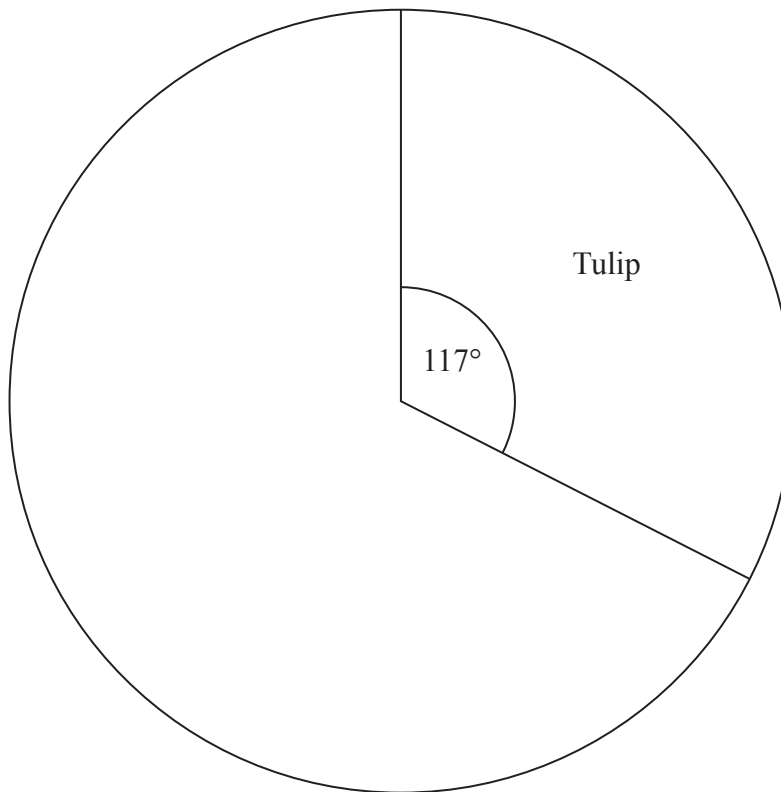
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- 6 Linda planted 400 flower bulbs.  
She planted daffodil bulbs, tulip bulbs and hyacinth bulbs.

The incomplete table and pie chart show some information about the bulbs.

Type of bulb	Number planted
Daffodil	180
Tulip	.....
Hyacinth	.....
<b>Total</b>	<b>400</b>



Complete the table and the pie chart.

(Total for Question 6 is 4 marks)



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

Price (£x)	Frequency		
$0 < x \leq 2000$	8		
$2000 < x \leq 4000$	14		
$4000 < x \leq 6000$	28		
$6000 < x \leq 8000$	10		
$8000 < x \leq 10000$	4		

- (a) Calculate an estimate for the mean price.

£ .....  
(4)

- (b) Complete the cumulative frequency table.

Price (£x)	Cumulative frequency
$0 < x \leq 2000$	
$0 < x \leq 4000$	
$0 < x \leq 6000$	
$0 < x \leq 8000$	
$0 < x \leq 10000$	

(1)

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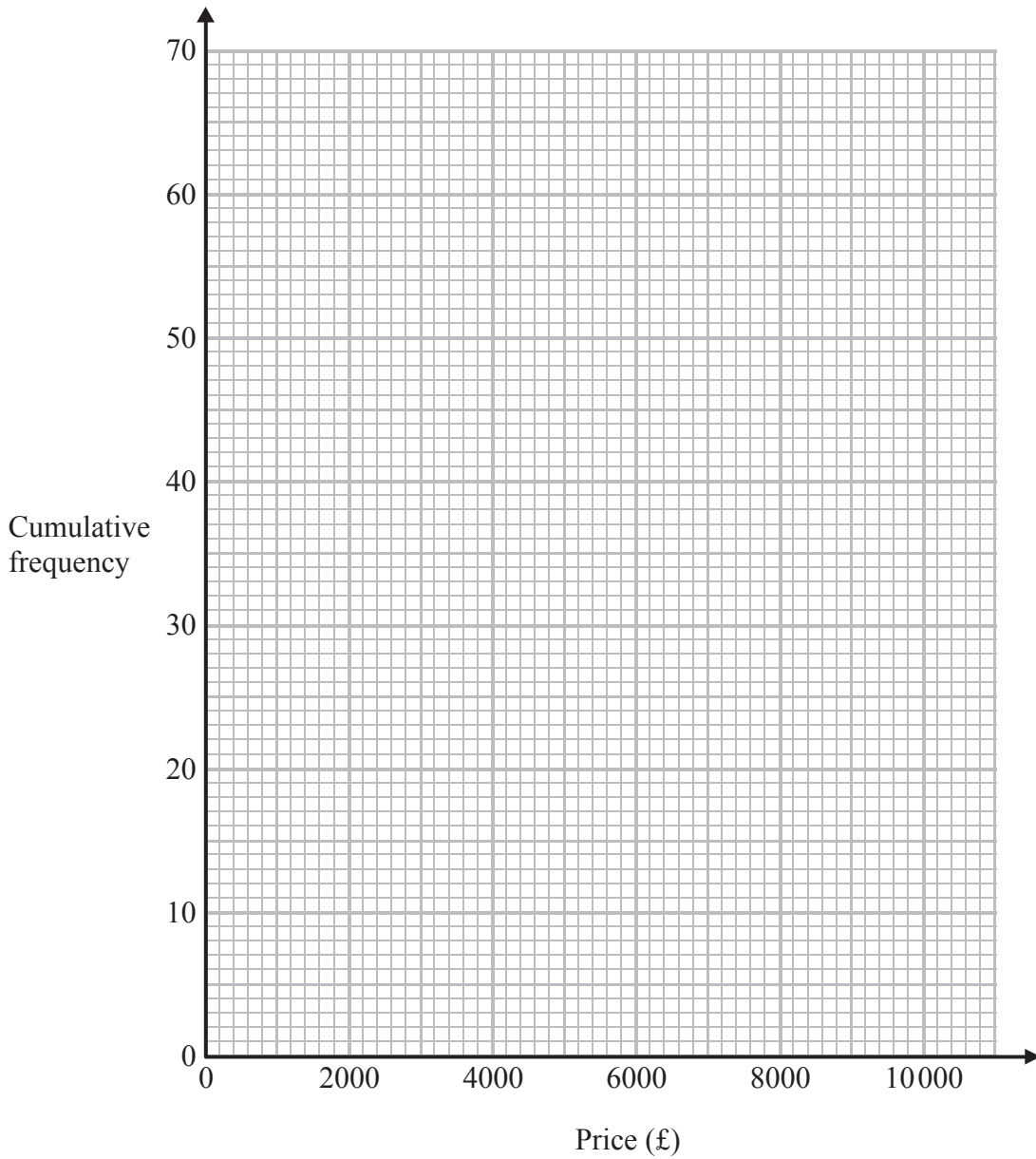
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(c) On the grid, draw a cumulative frequency graph for your table.



(2)

(d) Find an estimate for the interquartile range.

£.....

(2)

**(Total for Question 7 is 9 marks)**

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\*8 Seeta is organising a concert to raise money for a school and for a hospital.

A total of  $\frac{1}{20}$  of the money received from selling tickets will be spent on hiring a hall.

The rest of the money received from selling tickets will be given to the school and to the hospital in the ratio 2:3

Seeta expects to sell 1000 tickets at £23.50 each.

Work out the amount of money that Seeta expects to give to the school and to the hospital.

You must show all your working.

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(Total for Question 8 is 5 marks)



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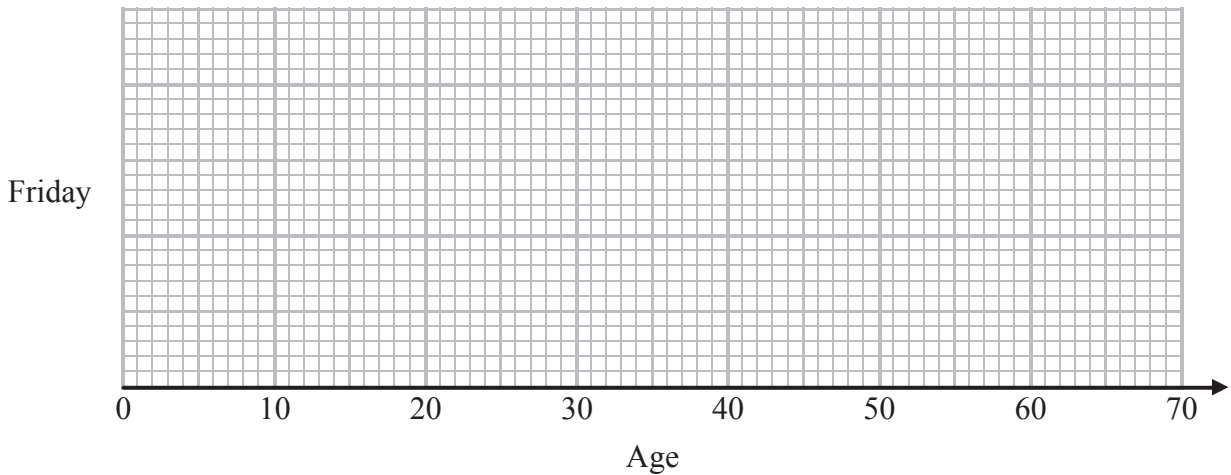
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9 Here are the ages of 15 people at a party on Friday.

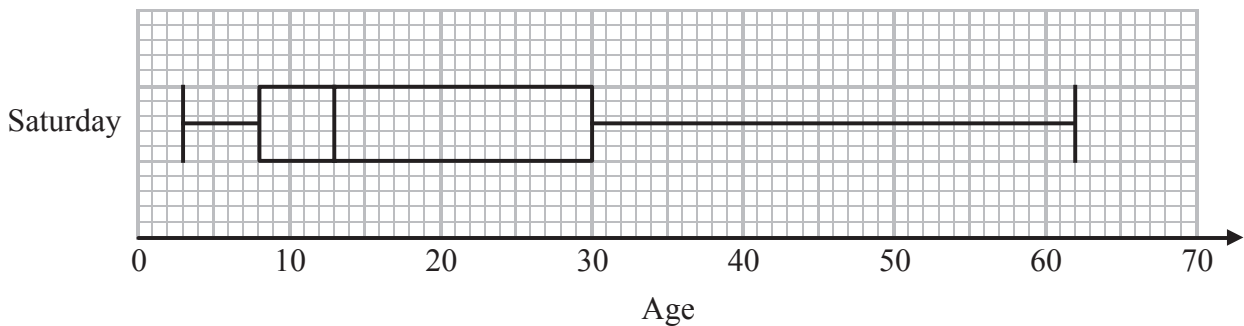
16 16 17 18 19 21 23 27 34 34 35 36 47 54 57

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



(3)

This box plot shows information about the ages of people at a party on Saturday.



\*(b) Compare the distribution of the ages of the people at the party on Saturday with the distribution of the ages of the people at the party on Friday.

.....

.....

.....

.....

(2)

**(Total for Question 9 is 5 marks)**



10 Alan works in a gym.

One week he recorded the number of people who visited the gym each day.

For Monday to Friday, the mean number of people per day was 98

For the whole week, the mean number of people per day was 114

On Saturday, 162 people visited the gym.

Work out the number of people who visited the gym on Sunday.

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

11 Danielle invested £2800 for  $n$  years in a savings account.

She was paid 2.5% per annum compound interest.

The interest is paid into the account at the end of each year.

At the end of  $n$  years, the amount of money in the savings account is greater than £3000 for the first time.

Work out the value of  $n$ .

.....  
(Total for Question 11 is 2 marks)

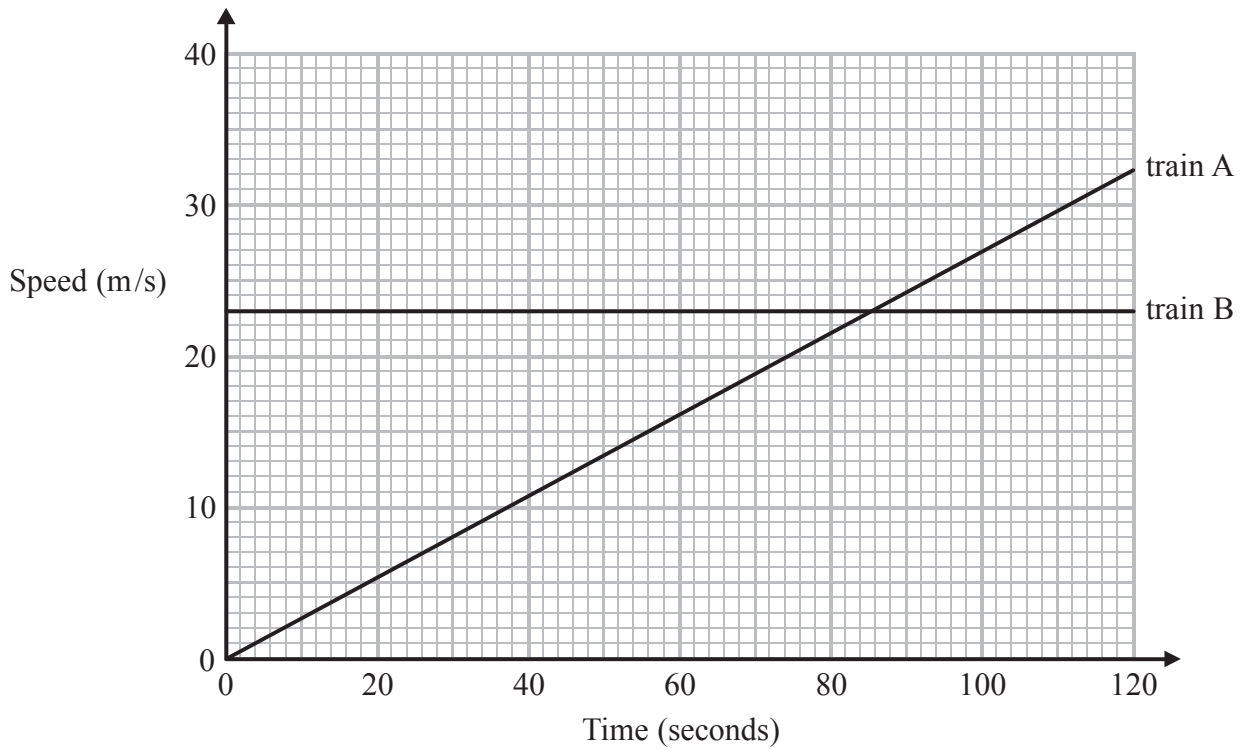
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12 The graph shows information about the speeds of two trains.



(a) Work out the gradient of the line for train A.

.....  
(2)

\*(b) Describe how the speed of train A and the speed of train B are changing in relation to time.

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

(Total for Question 12 is 3 marks)



- 13 The table shows information about 1720 people treated at a doctors' surgery.

Age	Male	Female
Under 16	125	130
16 to 59	486	465
60 and over	230	284

The surgery manager takes a sample of 50 patients stratified by age and by gender.

Work out the number of male patients of age 16 to 59 that should be in the sample.

.....  
(Total for Question 13 is 2 marks)

- 14 A weather forecast gives the probability of rain for each of three days.

Day	Probability of rain
Saturday	0.6
Sunday	0.3
Monday	0.2

The probability of rain on one day is independent of the probability of rain on a different day.

Work out the probability that it will rain on all 3 days.

.....  
(Total for Question 14 is 2 marks)

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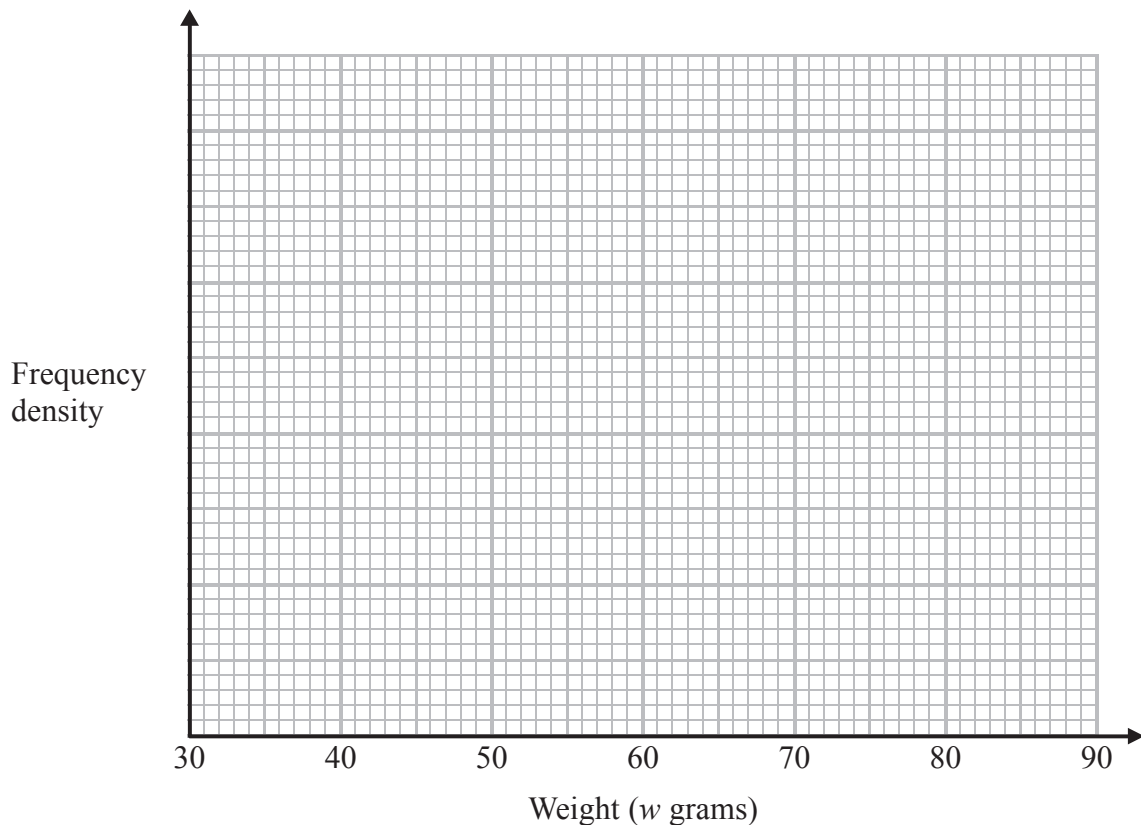


## 15 Billy keeps chickens.

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

Weight ( $w$ grams)	$30 < w \leq 50$	$50 < w \leq 60$	$60 < w \leq 70$	$70 < w \leq 85$
Number of eggs	12	20	17	6

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



(3)

Medium eggs weigh between 53 grams and 63 grams.

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

.....  
(3)

(Total for Question 15 is 6 marks)



- 16 There are six coins in a bag.  
The value of each coin is shown below.

£2      £1      £1      50p      50p      50p

Laura takes at random a coin from the bag and keeps it.  
Fahmida then takes at random a coin from the bag and keeps it.

Calculate the probability that Fahmida's coin has a greater value than Laura's coin.

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(Total for Question 16 is 3 marks)

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**TOTAL FOR PAPER IS 60 MARKS**

