| Surname | | Other Names | |
|---|---|---|---|
| Centre Number | | | Candidate Number | | | | | | | | | |
| Candidate Signature | | | | | | | | | | | | |

For Examiner's Use

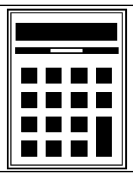
General Certificate of Secondary Education
March 2007

**MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/HA**
**Module 1 Higher Tier Section A**

**H**

Monday 5 March 2007 1.30 pm to 1.55 pm

**For this paper you must have:**
- a calculator
- mathematical instruments
- a treasury tag.



Time allowed for Section A: 25 minutes

**Instructions**
- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Use a calculator where appropriate.
- Do all rough work in this book.
- This paper is divided into two sections: Section A and Section B.
- After the 25 minutes allowed for Section A, you must put your calculator on the floor under your seat. You will then be given Section B.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

**Information**
- The maximum mark for Section A is 20.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

**Advice**
- In all calculations, show clearly how you work out your answer.

| For Examiner's Use | | | |
|---|---|---|---|
| **Section A** | | **Section B** | |
| Question | Mark | Question | Mark |
| 1 | | 6 | |
| 2 | | 7 | |
| 3 | | 8 | |
| 4 | | 9 | |
| 5 | | 10 | |
| Total Section A | | | |
| Total Section B | | | |
| TOTAL | | | |
| Examiner's Initials | | | |

LEAVE MARGIN BLANK

Answer **all** questions in the spaces provided.

**1** A student recorded the time, in minutes, that 50 people spent in the library.

| **Time, *t* (minutes)** | **Frequency** |
|---|---|
| $0 < t \leqslant 10$ | 2 |
| $10 < t \leqslant 20$ | 8 |
| $20 < t \leqslant 30$ | 20 |
| $30 < t \leqslant 40$ | 12 |
| $40 < t \leqslant 50$ | 8 |

Calculate an estimate of the mean number of minutes spent in the library.

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Answer ..... minutes *(4 marks)*

4

LEAVE MARGIN BLANK

**2** A box contains 200 pens.
The pens are either blue, green, purple or red.
There are 52 blue pens in the box.
The probability that a green pen is chosen from the box is 0.11
There are twice as many purple pens as red pens.

Calculate the number of red pens in the box.

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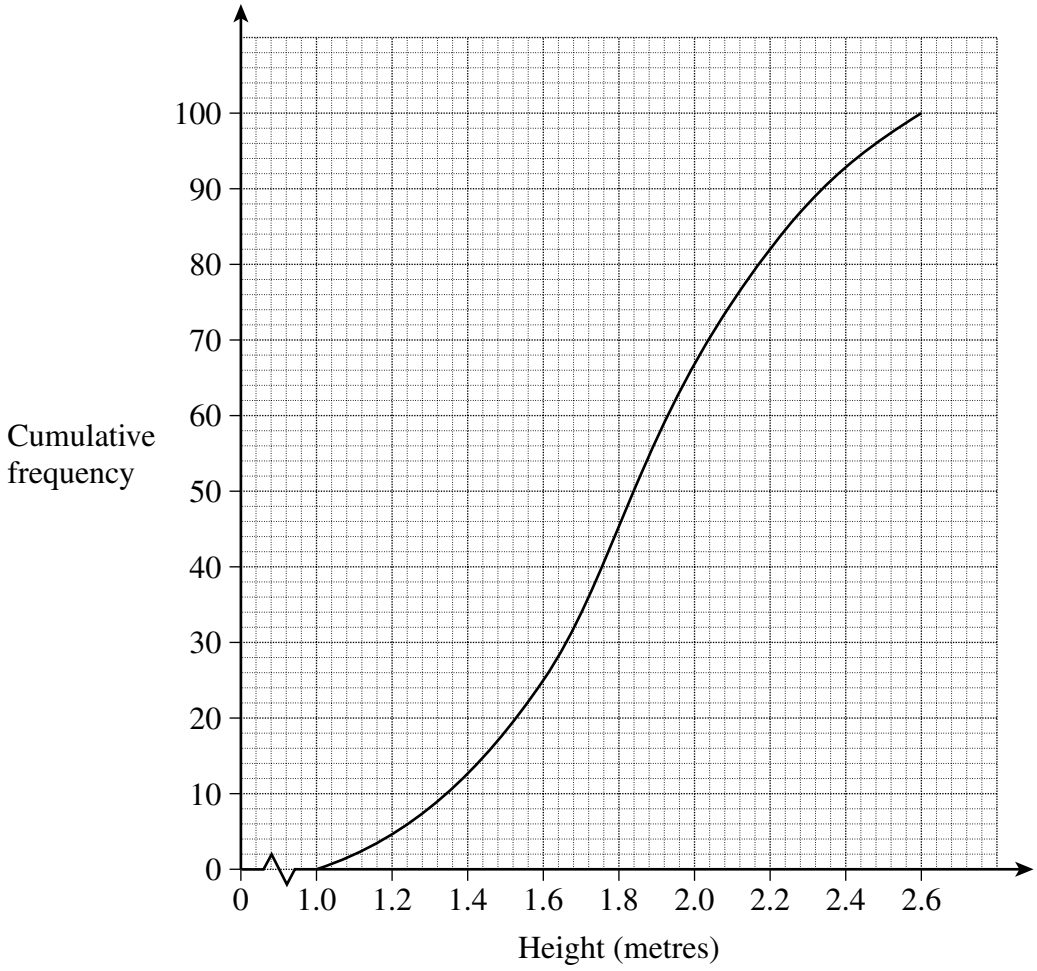
Answer ..... *(4 marks)*

4

**Turn over for the next question**

**3** The cumulative frequency diagram represents the heights of 100 sunflowers.




Use the diagram to estimate

(a) the interquartile range of the heights of these sunflowers

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Answer ..... metres *(2 marks)*

(b) the number of sunflowers with a height of more than 2.3 metres.

.....

.....

Answer ..... *(2 marks)*

4

**4** (a) Jo wants to choose 10 children from a group of 100 children.
She puts all their names in a hat and picks out 10 names.

Write down the type of sampling method Jo is using.

Answer ..... *(1 mark)*

(b) A children's athletics club has 300 members.
The table shows the number of members in each age group.

| **Under 11 yrs** | **11 - 12 yrs** | **13 - 14 yrs** | **15 yrs and over** |
|---|---|---|---|
| 45 | 78 | 96 | 81 |

Ciaran wants a stratified sample of 25 members.

Calculate the number of members that he should choose from each age group.

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Answer Under 11 yrs .....

11 - 12 yrs .....

13 - 14 yrs .....

15 yrs and over ..... *(3 marks)*

4

LEAVE MARGIN BLANK

**5** A bag contains 7 mint sweets, 3 fruit sweets and 5 toffee sweets.
Sam chooses two sweets from the bag at random.

Calculate the probability that the two sweets will be different types.

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Answer ..... *(4 marks)*

4

**END OF SECTION A**

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**There are no questions printed on this page**

| Surname | | Other Names | |
|---|---|---|---|
| Centre Number | | | Candidate Number | | | | | | | | | |
| Candidate Signature | | | | | | | | | | | | |

General Certificate of Secondary Education
March 2007

ASSESSMENT and QUALIFICATIONS ALLIANCE

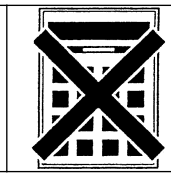
**MATHEMATICS (MODULAR) (SPECIFICATION B) 33001/HB**
**Module 1 Higher Tier Section B**

**H**

Monday 5 March 2007 2.00 pm to 2.25 pm

**For this paper you must have:**
- mathematical instruments.

You must **not** use a calculator.



Time allowed for Section B: 25 minutes

**Instructions**
- Use blue or black ink or ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book.
- You may **not** use your calculator in Section B. Your calculator must remain on the floor under your seat.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator. It must remain on the floor under your seat.
- At the end of the examination tag Section A and Section B together with Section A on top.

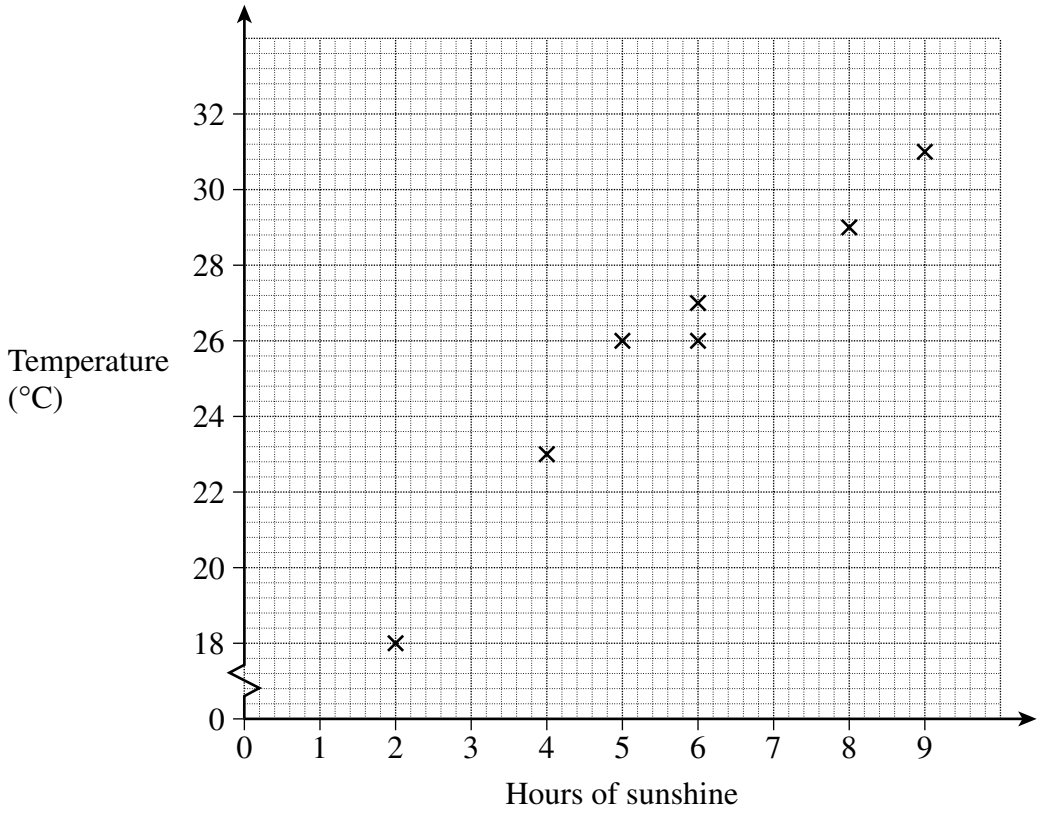
**Information**
- The maximum mark for Section B is 20.
- The marks for questions are shown in brackets.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

**Advice**
- In all calculations, show clearly how you work out your answer.

LEAVE MARGIN BLANK

Answer **all** questions in the spaces provided.

**6** The scatter graph shows the number of hours of sunshine and the maximum temperature at a seaside resort on seven days in June.




(a) Describe the strength and type of correlation shown by this data.

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*(1 mark)*

(b) Explain why it is not appropriate to use the scatter graph to estimate the temperature on a day in June when there are 15 hours of sunshine.

.....

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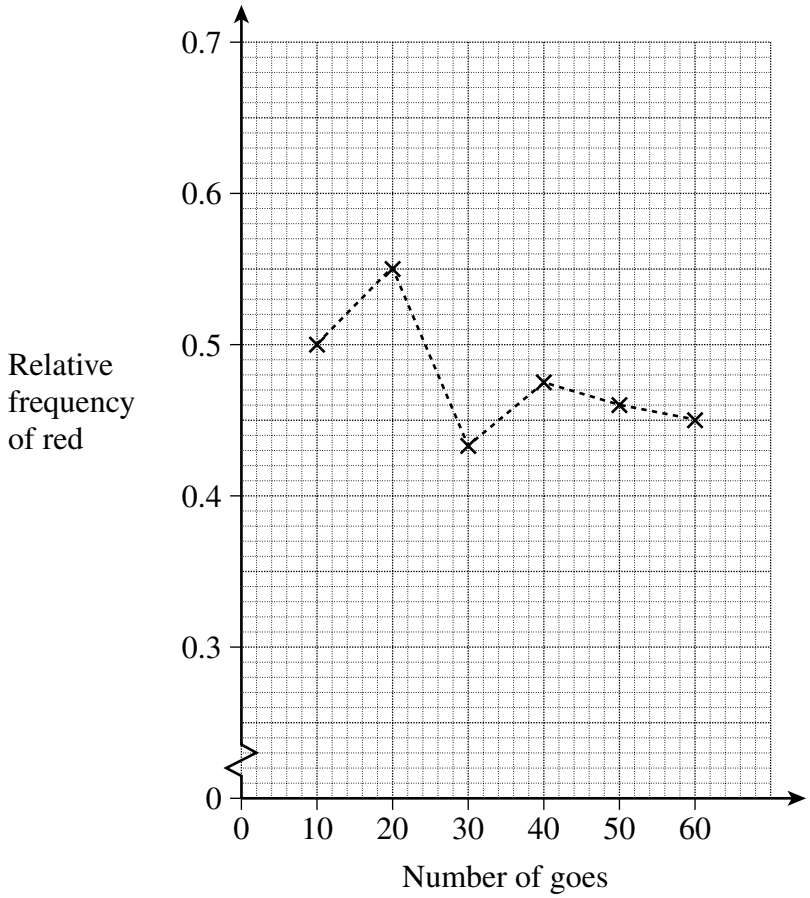
*(1 mark)*

**2**

**7** Amy has a bag containing red, green and blue balls.
She wants to know the probability of picking a red ball from the bag.
She picks a ball at random from the bag, records the colour and replaces the ball in the bag.
Amy does this 60 times and calculates the relative frequency of red after every 10 goes.
Her results are shown on the graph.




(a) Use the graph to calculate the number of times Amy picked a red ball in the first 10 goes.

.....

Answer ..... *(2 marks)*

(b) What is the best estimate for the probability of picking a red ball?
Explain your answer.

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*(2 marks)*

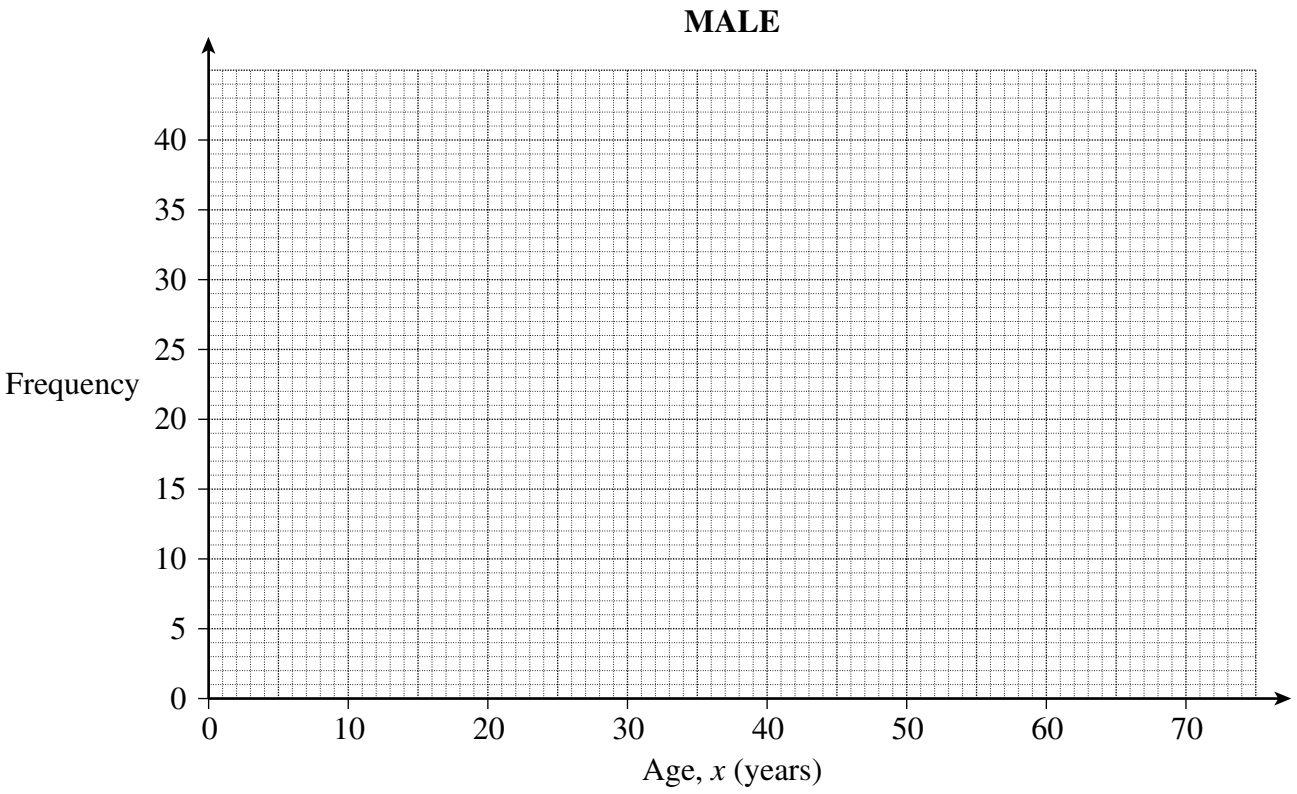
4

**Turn over ►**

**8** A badminton club has both male and female members.
The table shows the distribution of the ages of the male club members.

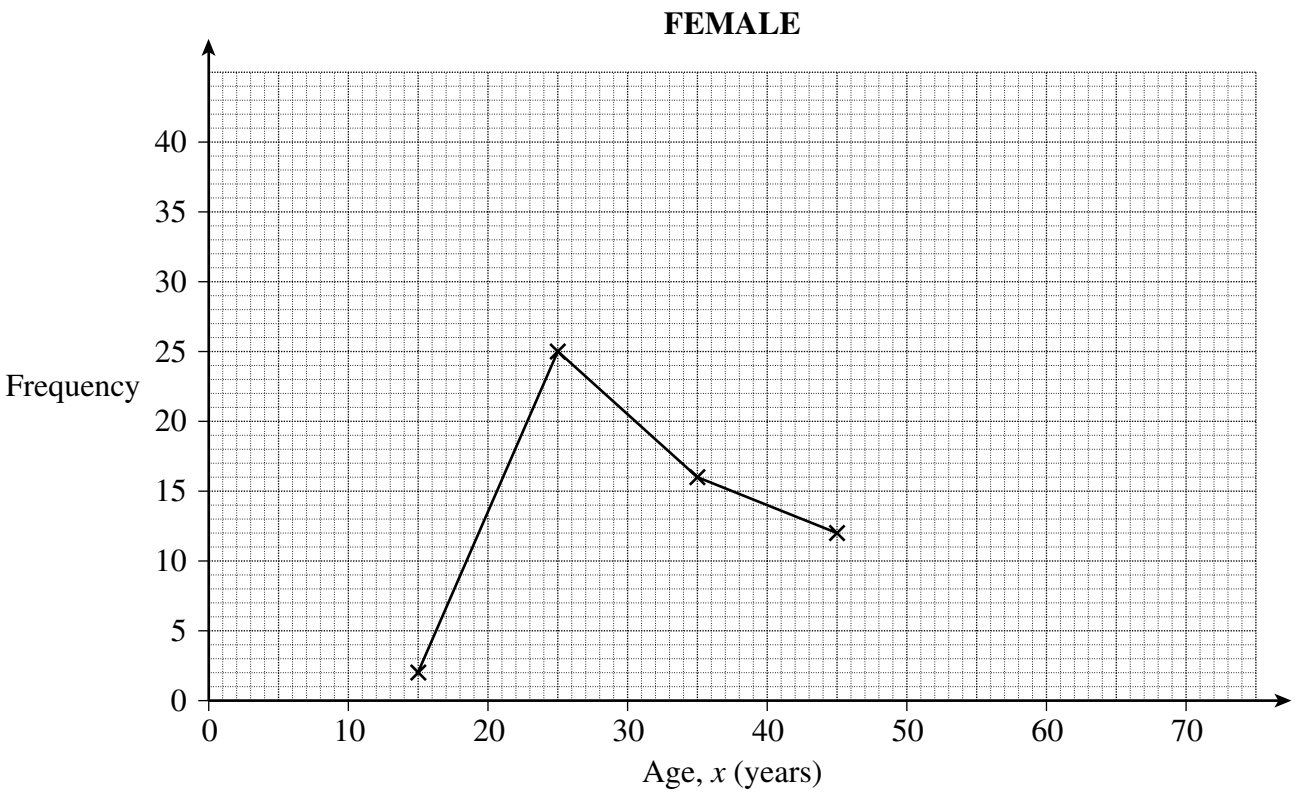
| **Age, $x$ (years)** | **Frequency** |
|---|---|
| $10 \leqslant x < 20$ | 6 |
| $20 \leqslant x < 30$ | 28 |
| $30 \leqslant x < 40$ | 36 |
| $40 \leqslant x < 50$ | 23 |
| $50 \leqslant x < 60$ | 14 |
| $60 \leqslant x < 70$ | 2 |

(a) Draw a frequency polygon for this data.




*(2 marks)*

(b) The frequency polygon below shows the age distribution of the female club members.




Write down **two** comparisons between the ages of the male and female members at this club.

Comparison 1: .....

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.....

Comparison 2: .....

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*(2 marks)*

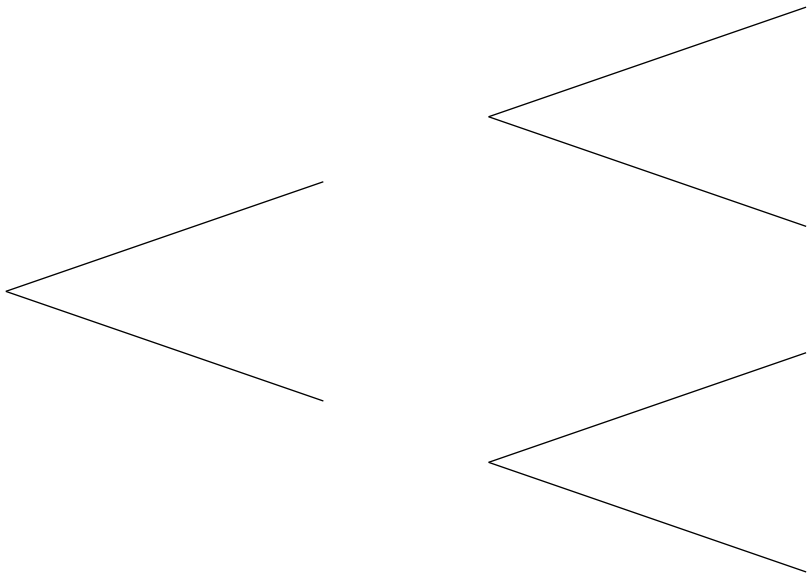
4

**9** Ingrid has a spinner labelled with even and odd numbers.

The probability that it will land on an even number is $\frac{2}{5}$ .

Ingrid spins the spinner twice.

(a) Complete and label the tree diagram to show all the probabilities of obtaining even and odd numbers.



*(3 marks)*

(b) Calculate the probability of spinning two numbers which multiply to give an even number.

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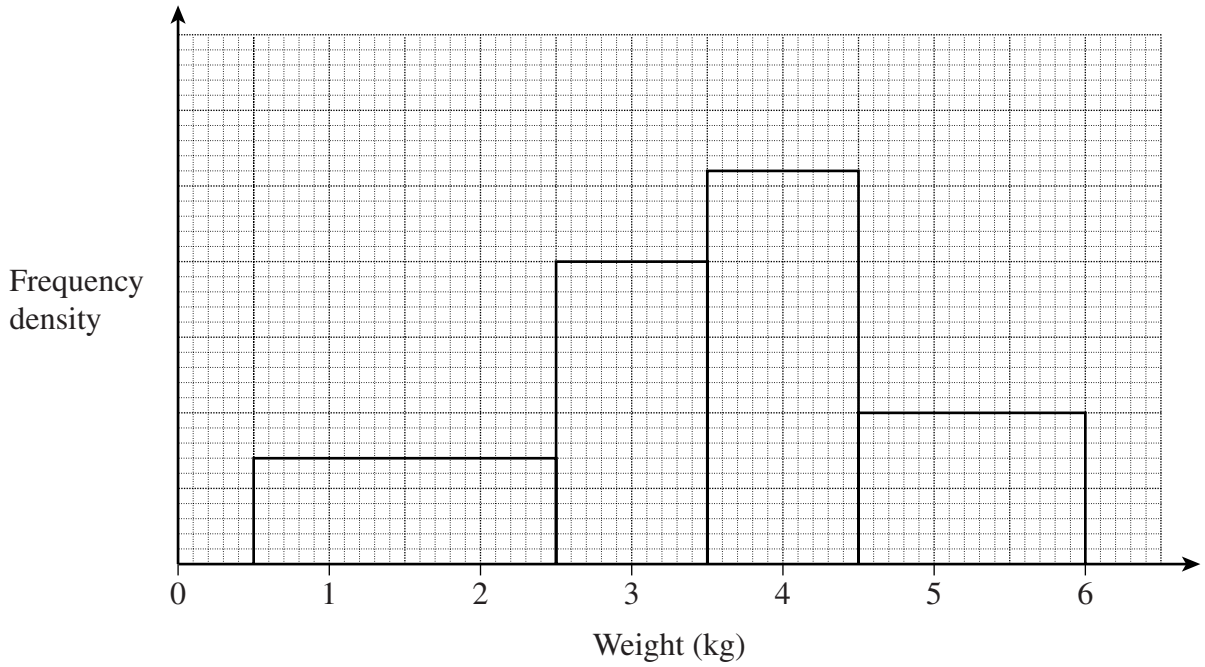
Answer ..... *(3 marks)*

6

**10** The histogram represents the birth weights of 150 babies.




Thirty babies weighed over 4.5 kg
Babies weighing under 2 kg are taken to the Special Care Baby Unit.

Calculate the number of babies taken to the Special Care Baby Unit.

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Answer ..... *(4 marks)*

4

**END OF QUESTIONS**

**There are no questions printed on this page**