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

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General Certificate of Secondary Education
November 2006



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

33001/HA

H

Monday 13 November 2006 1.30 pm to 1.55 pm

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| <p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments • a treasury tag | |
|--|--|

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

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.

There are no questions printed on this page

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

- 1 50 new members of a fitness club were timed to complete a set of exercises. Their results are summarised in the table.

| Time, t (seconds) | Frequency |
|---------------------|-----------|
| $100 \leq t < 120$ | 18 |
| $120 \leq t < 140$ | 12 |
| $140 \leq t < 160$ | 15 |
| $160 \leq t < 180$ | 5 |

- (a) Calculate an estimate of the mean time.

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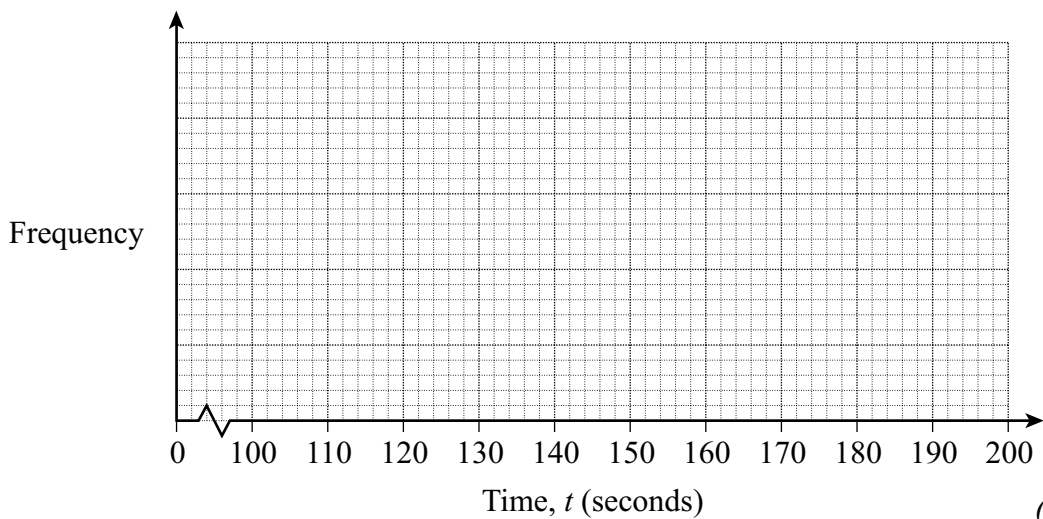
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Answer seconds (4 marks)

- (b) Draw a frequency polygon for the data in the table.



(2 marks)

- 2 100 students recorded the number of hours in a week they spent using a computer. The table shows the results.

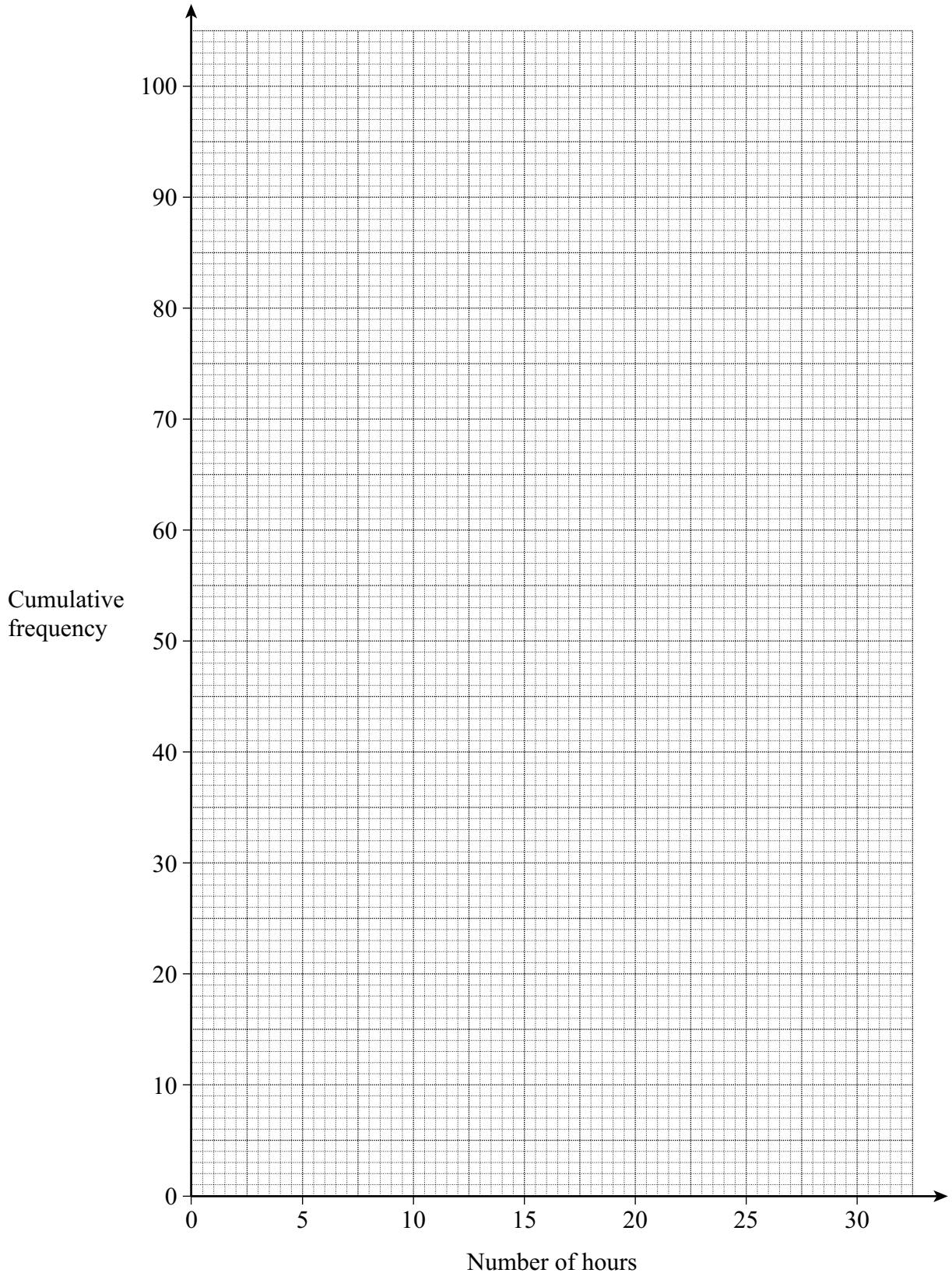
| Number of hours | Frequency |
|------------------------|------------------|
| 0 to less than 5 | 17 |
| 5 to less than 10 | 23 |
| 10 to less than 15 | 18 |
| 15 to less than 20 | 16 |
| 20 to less than 25 | 15 |
| 25 to less than 30 | 11 |

- (a) Complete the cumulative frequency table below.

| Number of hours | Cumulative frequency |
|------------------------|-----------------------------|
| Less than 5 | 17 |
| Less than 10 | 40 |
| Less than 15 | |
| Less than 20 | |
| Less than 25 | |
| Less than 30 | |

(1 mark)

- (b) Draw a cumulative frequency diagram on the grid opposite.



(3 marks)

- (c) Use your graph to estimate the number of students who spent more than 17 hours using a computer.

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Answer (2 marks)

Turn over ►

- 3 Corri works in an electrical shop.
She is asked to test a sample of 50 light bulbs stratified by type of light bulb.
The table shows the number of each type of bulb in the shop.

| Type of bulb | 40 W | 60 W | 100 W |
|-----------------|------|------|-------|
| Number of bulbs | 240 | 680 | 150 |

Calculate the number of 60 W bulbs required for her stratified sample.

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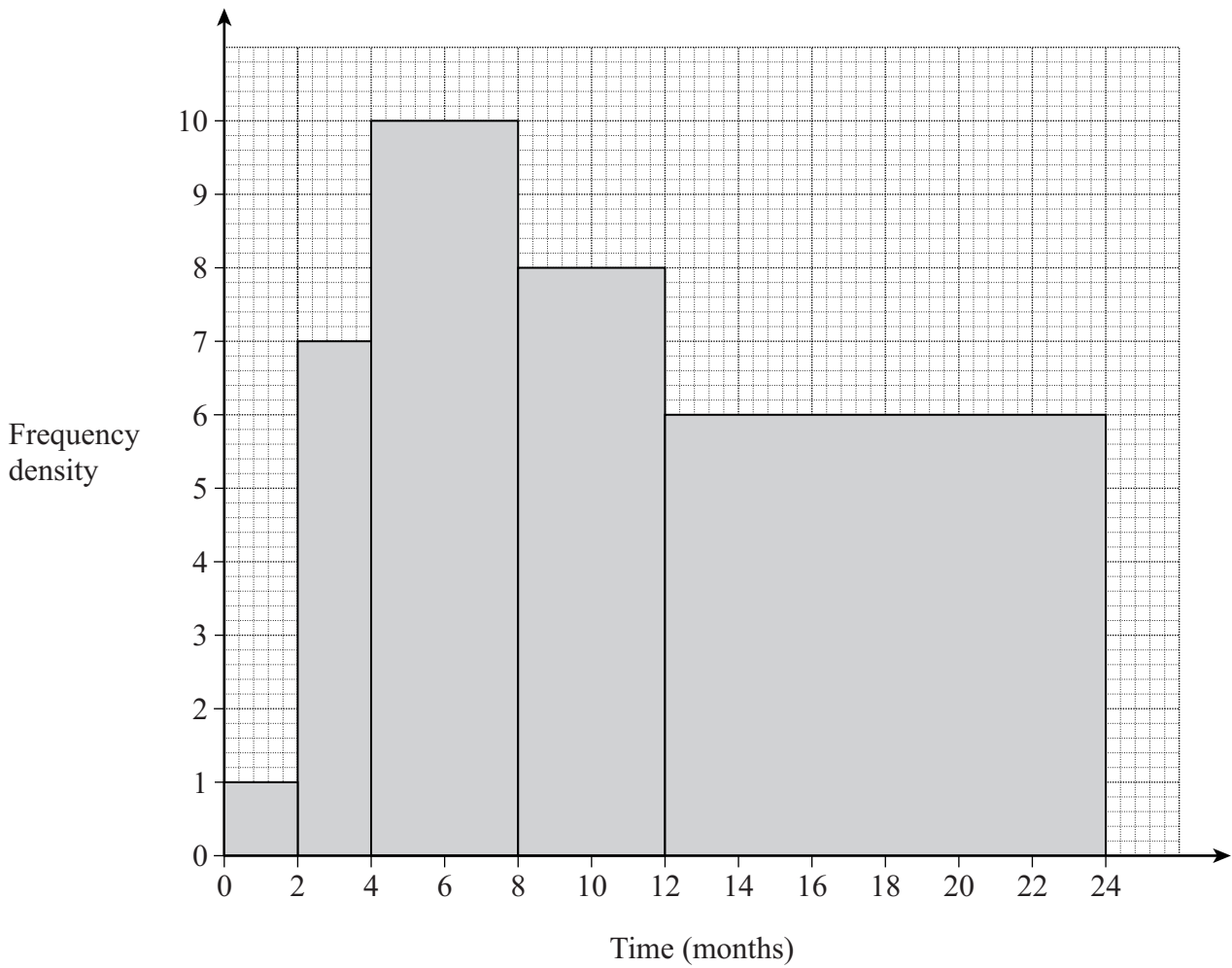
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Answer (3 marks)

4 The histogram shows the length of time it takes to sell houses on an estate.



(a) Calculate the total number of houses that were sold.

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Answer (2 marks)

(b) Calculate an estimate of the median time to sell a house on the estate.
 Show your working.

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Answer months (3 marks)

END OF SECTION A

There are no questions printed on this page

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

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General Certificate of Secondary Education
November 2006




MATHEMATICS (MODULAR) (SPECIFICATION B)
Module 1 Higher Tier Section B

33001/HB

H

Monday 13 November 2006 2.00 pm to 2.25 pm

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|---|---|
| <p>For this paper you must have:</p> <ul style="list-style-type: none"> • mathematical instruments <p>You must not use a calculator.</p> |  |
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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.

There are no questions printed on this page

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

- 5 Phil wants to test if a six-sided dice is biased.
He rolls the dice 20 times.
Here are his results.

2 3 5 6 1 2 4 5 6 2
3 4 2 1 2 3 5 6 2 1

- (a) Complete the relative frequency table.

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| | | | | | | |
|---------------------------|---|---|---|---|---|---|
| Number | 1 | 2 | 3 | 4 | 5 | 6 |
| Relative frequency | | | | | | |

(2 marks)

- (b) Phil concludes that the dice is biased towards a number.

Write down the number that you think the dice is biased towards.
Explain your answer.

Number

Explanation
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(1 mark)

- (c) Phil decides to roll the dice 100 times.
Calculate an estimate of the number of times that the dice will land on 4.

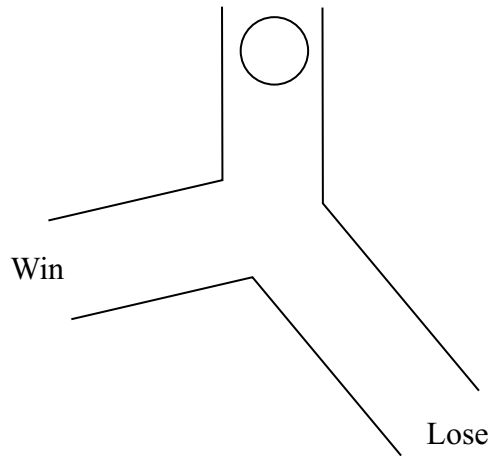
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Answer (2 marks)

6 In a game a ball is dropped down a chute as shown in the diagram.

The ball falls into either the Win slot or the Lose slot.

The probability that the ball falls into the Win slot is always $\frac{3}{10}$



Andrea plays the game twice.

(a) Draw a tree diagram to show the outcomes and the probabilities.

(3 marks)

(b) Calculate the probability that Andrea loses both times.

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Answer (2 marks)

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Turn over for the next question

Turn over 

7 The quarterly heating costs for a house are shown in the table.

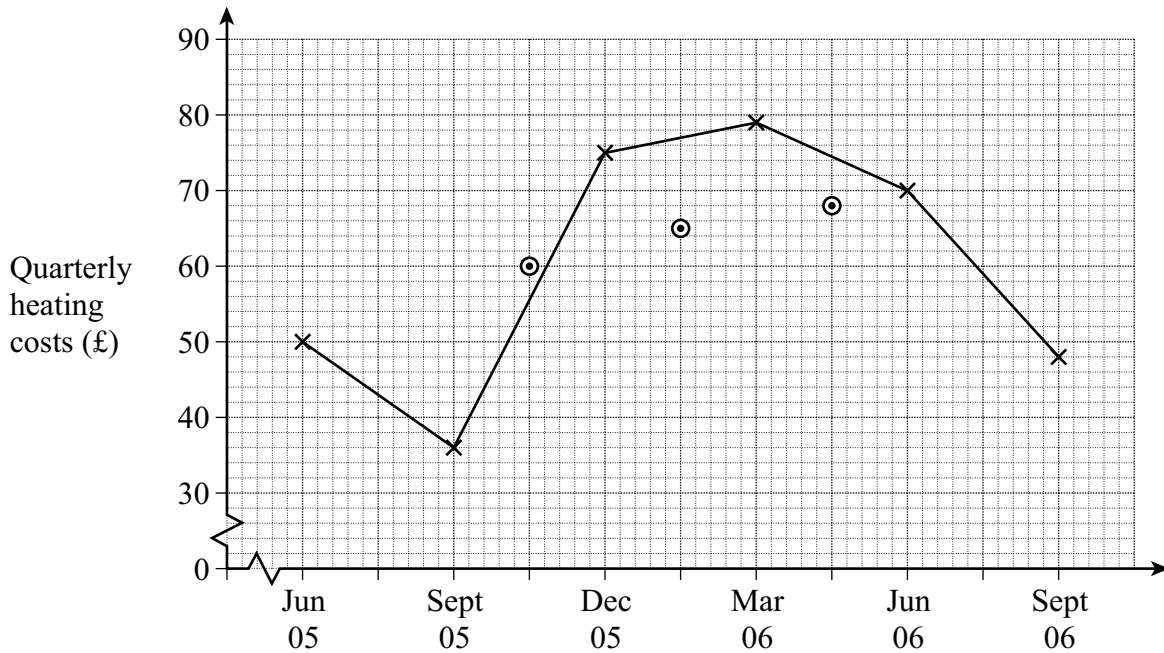
| Date | Jun 05 | Sept 05 | Dec 05 | Mar 06 | Jun 06 | Sept 06 | Dec 06 |
|-------------------|--------|---------|--------|--------|--------|---------|--------|
| Heating costs (£) | 50 | 36 | 75 | 79 | 70 | 48 | |

(a) Why is a four-point moving average appropriate for this data?

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(1 mark)

(b) The heating costs and the moving averages are plotted below.



(i) Use a trend line to predict the value of the next four-point moving average.

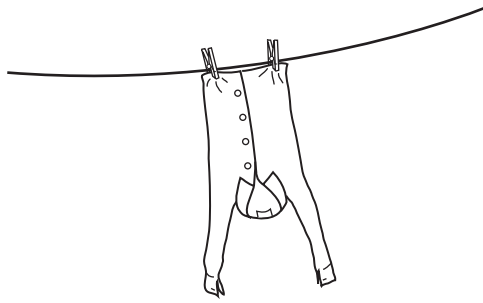
Answer £ (1 mark)

(ii) Hence calculate an estimate of the heating costs for December 2006.

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Answer £ (3 marks)

8 Joe hangs a shirt on the washing line using coloured pegs from a bag.



The bag contains 10 red, 5 yellow and 5 green pegs.
Joe picks two pegs at random from the bag to hang the shirt.

Calculate the probability that he picks two pegs of the same colour.

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Answer (5 marks)

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END OF QUESTIONS

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