

## Tree Diagrams (Probability)

Please write clearly in block capitals

Forename:

Surname:

### Materials

For this paper you must have:

- mathematical instruments



You **can** use a calculator.

### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

### Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

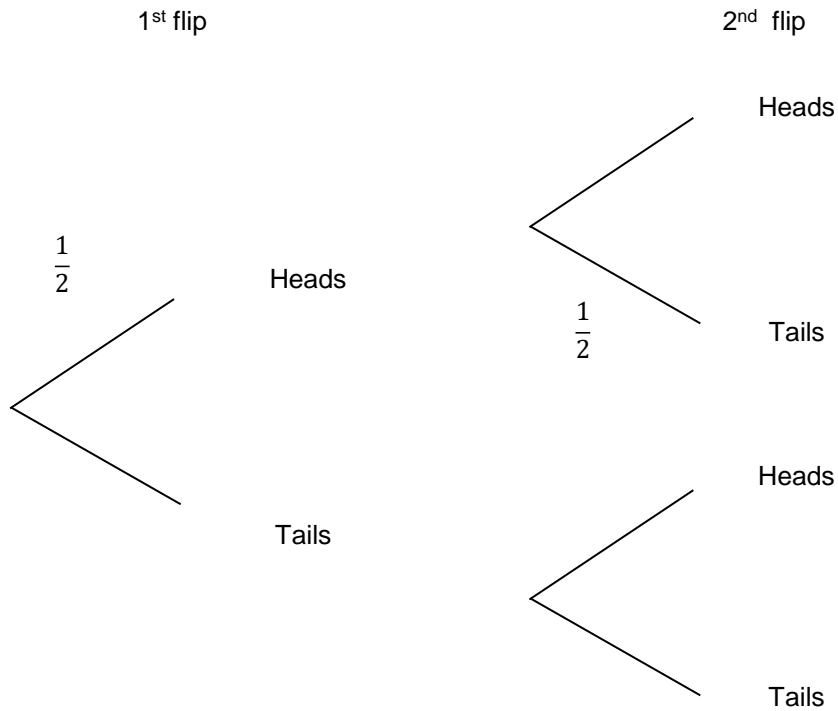
### Advice

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

1 Ben flips an unbiased coin 2 times.

1(a) Complete the probability tree below, to show the results of the two flips.

[2 marks]



1(b) Hence, or otherwise, calculate the probability that both flips land on heads.

[2 marks]

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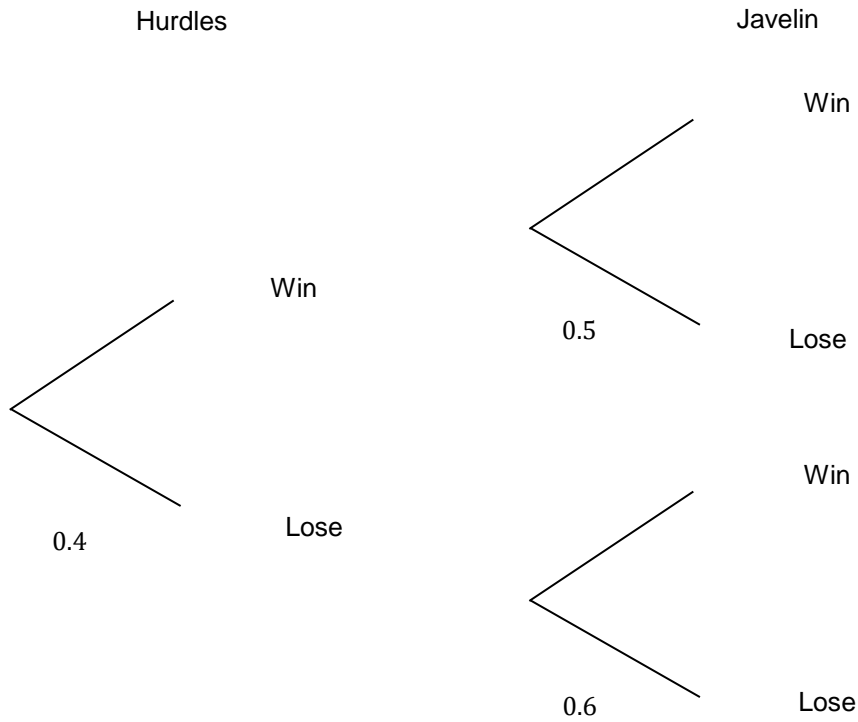
Answer \_\_\_\_\_

Turn over for next question

**2** Katie completes two events at her school sports day, hurdles and javelin.

**2(a)** Complete the probability tree diagram below showing the probabilities of Katie winning each event.

**[2 marks]**



**2(b)** Calculate the probability that Katie wins one event and loses the other.

**[2 marks]**

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Answer \_\_\_\_\_

**Turn over for next question**

**3** The probability of Ben completing his Maths homework on any night is  $\frac{1}{3}$

The probability that he completes his English homework is  $\frac{1}{4}$

These are both independent events.

**3(a)** In the space below, draw a probability tree diagram to represent this information

**[3 marks]**

**3(b)** Calculate the probability that Ben completes both pieces of homework

**[1 mark]**

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Answer \_\_\_\_\_

**3(c)** Calculate the probability that Ben completes exactly one piece of homework

**[2 marks]**

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Answer \_\_\_\_\_

**Turn over for next question**

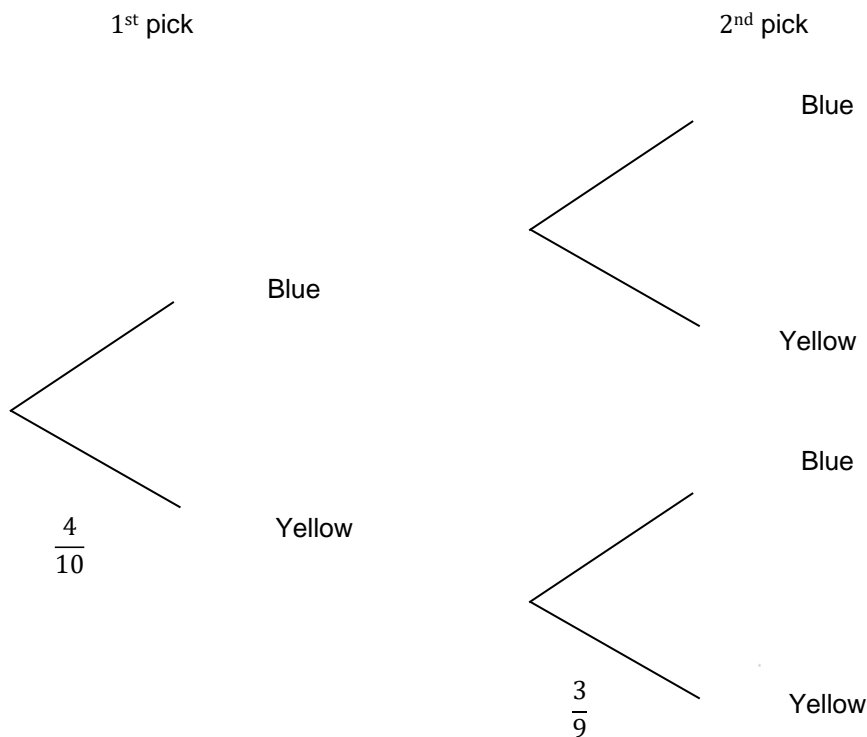
6

Turn over ►

- 4** 10 counters are in a bag, 6 are blue and 4 are yellow.  
One counter is taken from the bag at random and not replaced.  
A second counter is then taken from the bag at random.

- 4(a)** Complete the probability tree diagram below showing the probabilities of taking counters from the bag.

[2 marks]



- 4(b)** Calculate the probability that after the second pick, 1 blue counter and 1 yellow counter have been removed from the bag.

[2 marks]

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Answer \_\_\_\_\_

**Turn over for next question**

Turn over ►

**5** There are 5 red balls and 6 green balls in a bag.  
One ball is drawn from the bag, then another without replacement.

**5(a)** In the space below, draw a probability tree diagram to represent this information

**[3 marks]**

**5(b)** Calculate the probability that one red and one green ball are taken from the bag.

**[2 marks]**

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Answer \_\_\_\_\_

**5(c)** Calculate the probability that the two balls drawn are the same colour.

**[2 marks]**

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Answer \_\_\_\_\_

Turn over ►

6 There are  $x$  balls in a bag.

8 of the balls are blue.

3 of the balls are green.

The rest of the balls are orange and pink.

Jake takes two balls from the bag without replacement.

The probability that he takes a blue then green ball is  $\frac{1}{10}$ .

Find the total number of balls in the bag.

[5 marks]

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Answer \_\_\_\_\_