

Tree Diagrams (Probability)

Please write clearly in block capitals

Forename:

Surname:

Materials

For this paper you must have:

- mathematical instruments



You must **not** 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

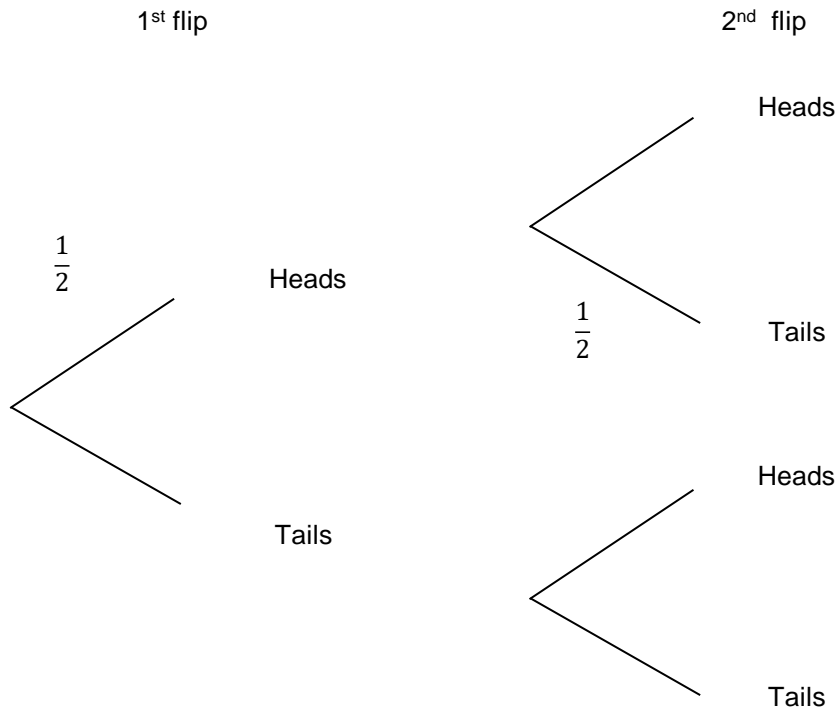
- In all calculations, show clearly how you work out your answer.

1 Ben flips an unbiased coin 2 times.

(Level 5)

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

[2 marks]



Hence, or otherwise, calculate the probability that both flips land on heads.

[2 marks]

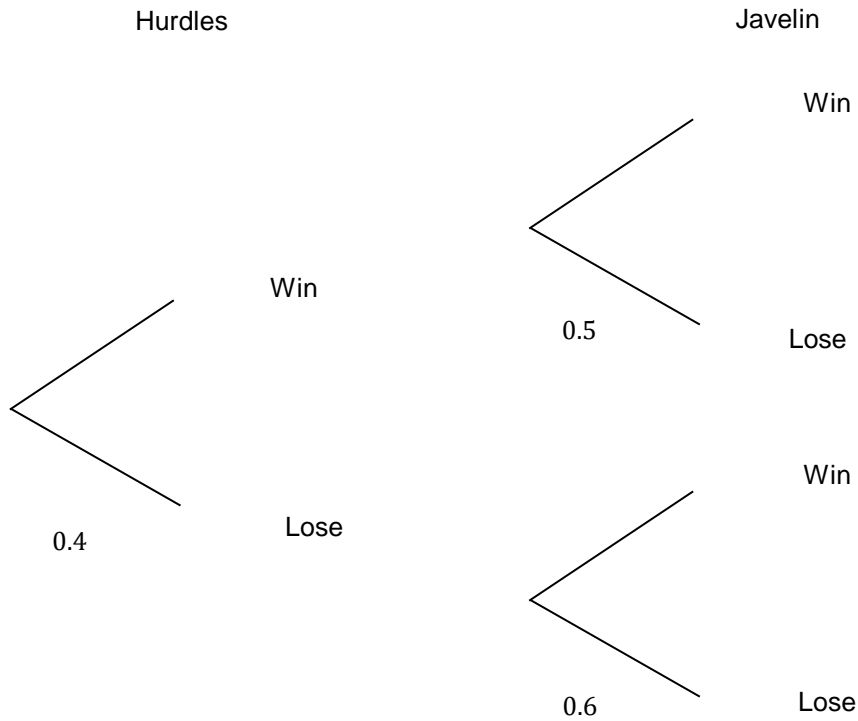
Answer _____

Turn over for next question

2 Katie completes two events at her school sports day, hurdles and javelin. (Level 5)

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]

Answer _____

Turn over for next question

- 3** The probability of Ben completing his Maths homework on any night is $\frac{1}{3}$. *(Level 5)*
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]

Answer _____

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

[2 marks]

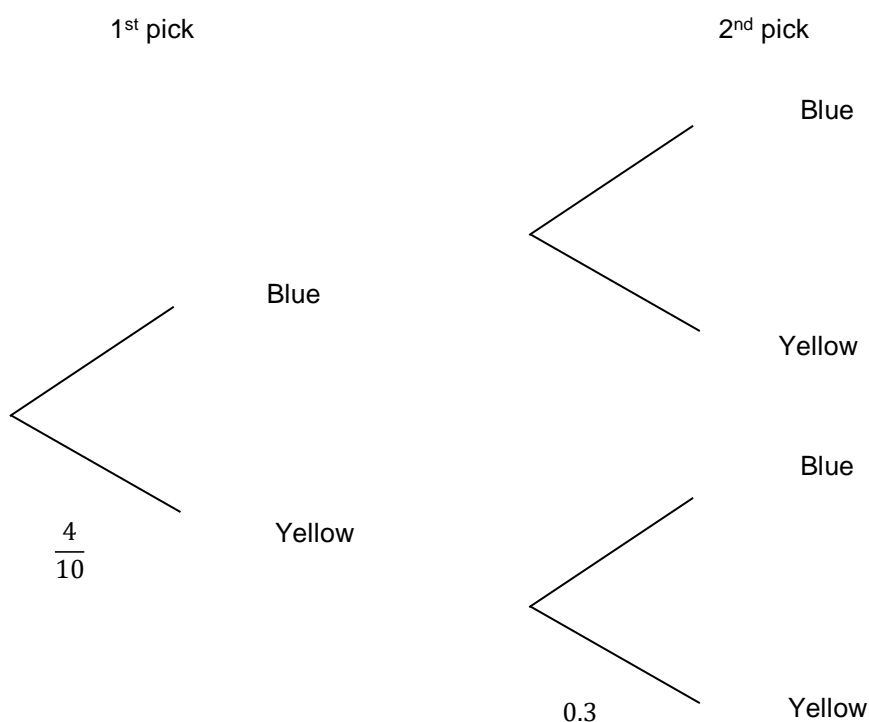
Answer _____

Turn over for next question

- 4** 10 counters are in a bag, 6 are blue and 4 are yellow. (Level 6)
 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 has been removed from the bag.

[2 marks]

Answer _____

Turn over for next question

Turn over ►

5 There are 5 red balls and 6 green balls in a bag. *(Level 7)*
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]**

Answer _____

5(c) Calculate the probability that a green ball is drawn second, given that a red ball was drawn first. **[2 marks]**

Answer _____

6 There are x balls in a bag.

(Level 8)

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]

Answer _____



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