

## Exam Questions

# Tree Diagrams & Combined Probability

Probability Tree Diagrams / Combined Probability

|                      |            |
|----------------------|------------|
| Easy (5 questions)   | /16        |
| Medium (5 questions) | /15        |
| Hard (4 questions)   | /18        |
| <b>Total Marks</b>   | <b>/49</b> |

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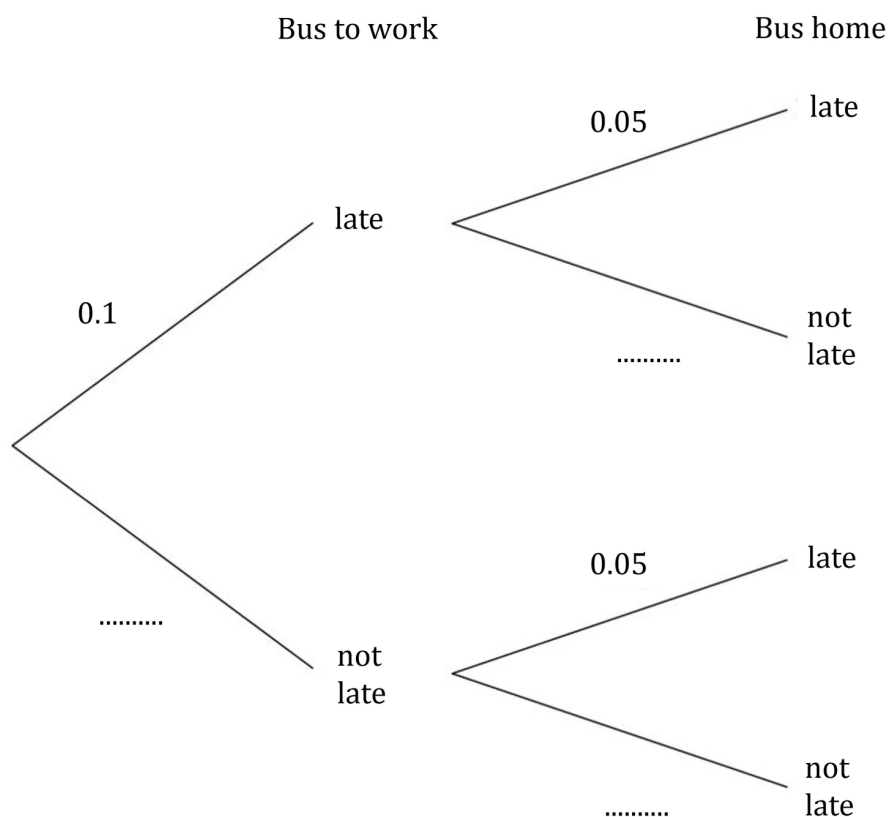
# Easy Questions

**1 (a)** Tom gets a bus at the same time each morning to go to work.

He gets a bus at the same time each evening to come home.

The probability tree diagram shows the probabilities of each bus arriving late.

Complete the probability tree diagram.



(2 marks)

**(b)** For a day that Tom goes to work, calculate the probability that the bus to work and the bus home will both arrive late.

(2 marks)

**2 (a)** William has two boxes of apples.

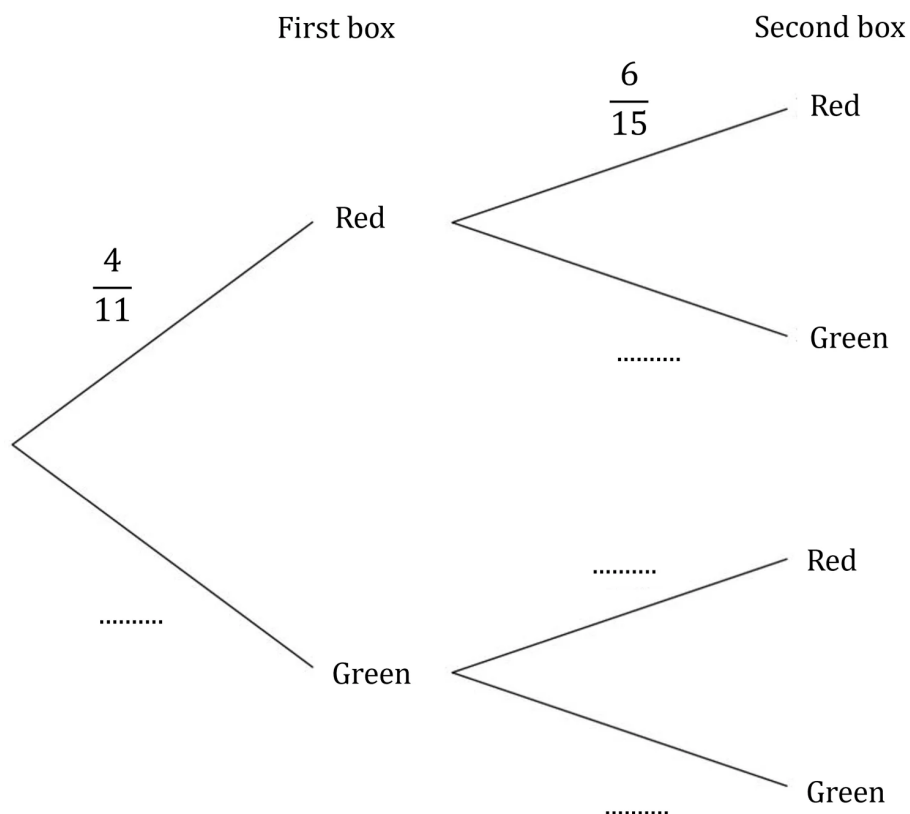
In the first box there are 4 red apples and 7 green apples.

In the second box there are 6 red apples and 9 green apples.

William takes at random an apple from the first box.

He then takes at random an apple from the second box.

Complete the probability tree diagram.



**(2 marks)**

**(b)** Find the probability that William selects a green apple from each box.

**(2 marks)**

- 3 A fair coin with two sides can land on either side when flipped. One side is called heads, and the other side is called tails.

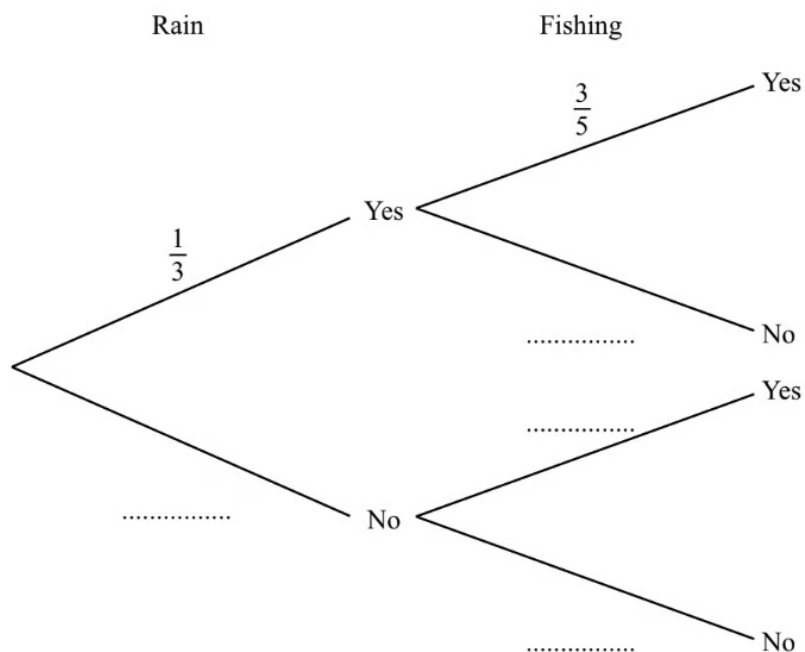
Find the probability of the coin being flipped three times, and landing on heads every time.

(2 marks)

- 4 On any day the probability that it rains is  $\frac{1}{3}$ .

When it rains the probability that Amira goes fishing is  $\frac{3}{5}$ . When it does not rain the probability that Amira goes fishing is  $\frac{3}{4}$ .

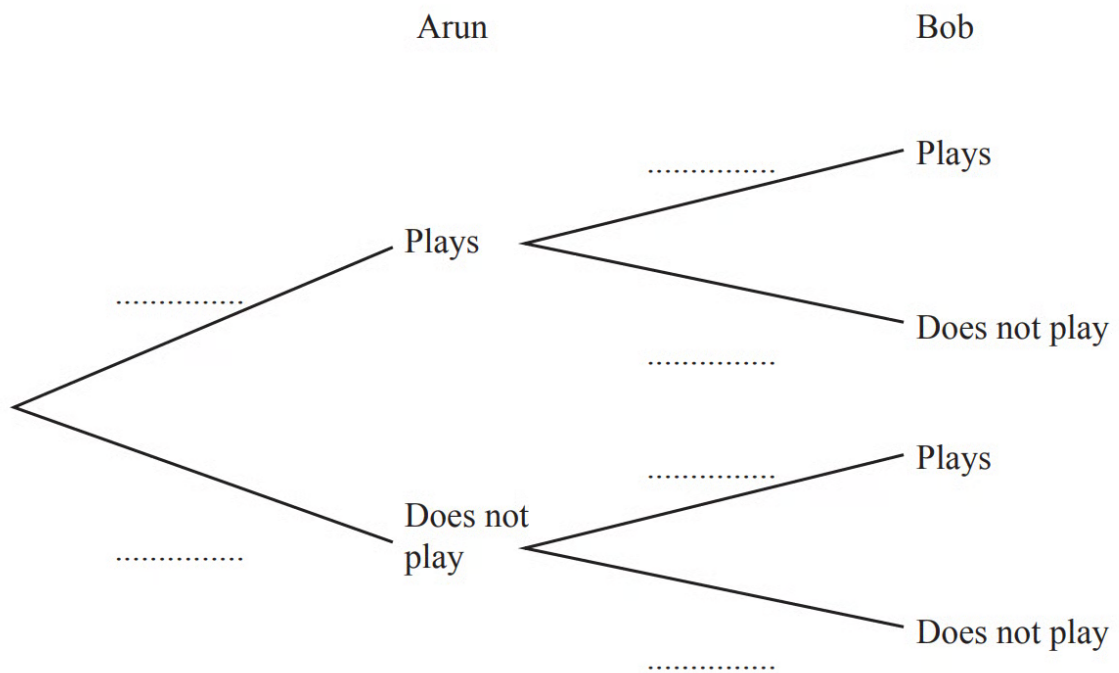
Complete the tree diagram.



(2 marks)

- 5 On any Saturday, the probability that Arun plays football is  $\frac{3}{4}$ . On any Saturday, the probability that Bob plays football is  $\frac{2}{5}$ .

i) Complete the tree diagram.



[2]

ii) Calculate the probability that, one Saturday, Arun and Bob both play football.

[2]

**(4 marks)**

# Medium Questions

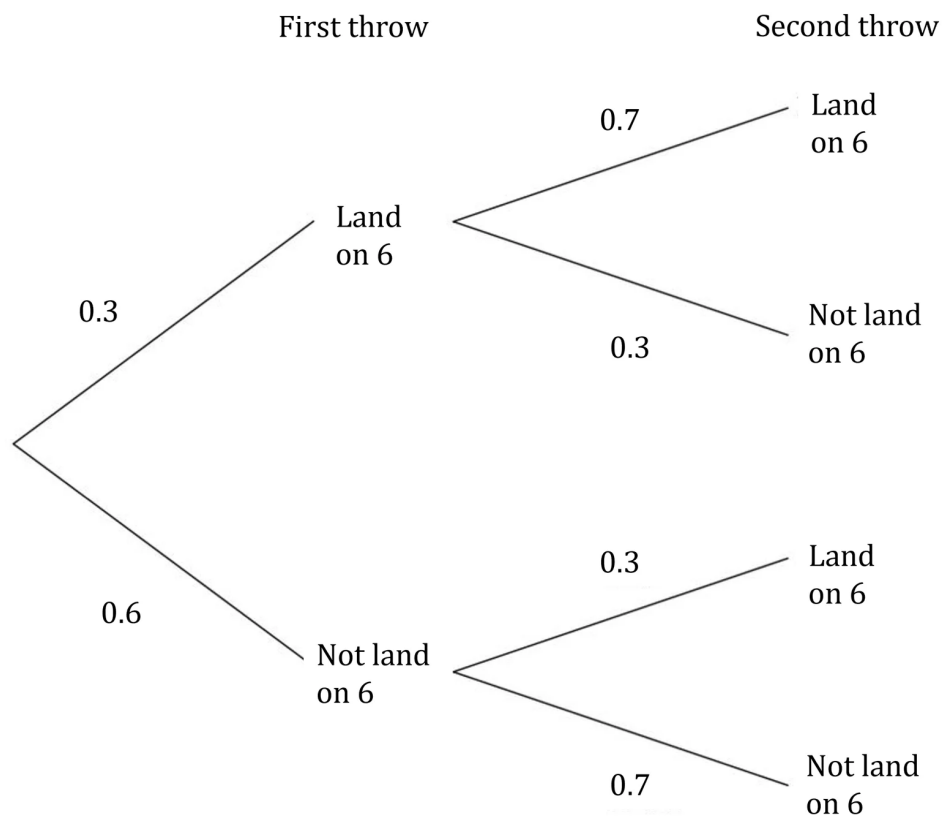
- 1 When a **biased** 6-sided dice is thrown once, the probability that it will land on 6 is 0.3.

The biased dice is thrown twice.

Sophie draws this probability tree diagram.

The diagram is **not correct**.

Write down two things that are wrong with the probability tree diagram.



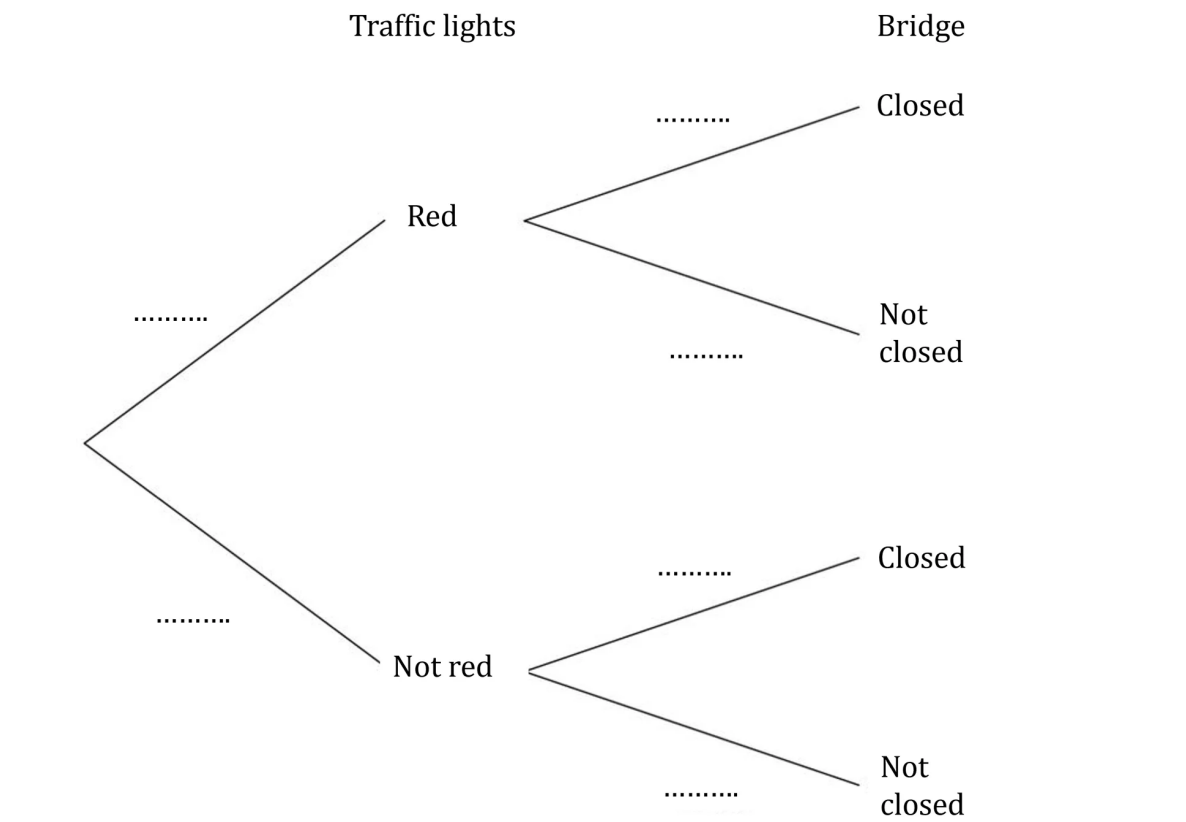
(2 marks)

- 2 (a)** On Amelia's route to work, she drives through a set of traffic lights. She also has to cross a bridge, which is sometimes closed to cars.

The probability that the traffic lights will be red when she reaches them is 0.4.

The probability that the bridge is closed when she reaches it is 0.1.

Complete the probability tree diagram below.



**(2 marks)**

- (b)** Find the probability of the traffic lights being red, and the bridge not being closed.

**(2 marks)**

- 3** A fair dice with 6 faces, labelled 1 to 6, is rolled twice.

Find the probability of not rolling a 1 on either of the rolls.

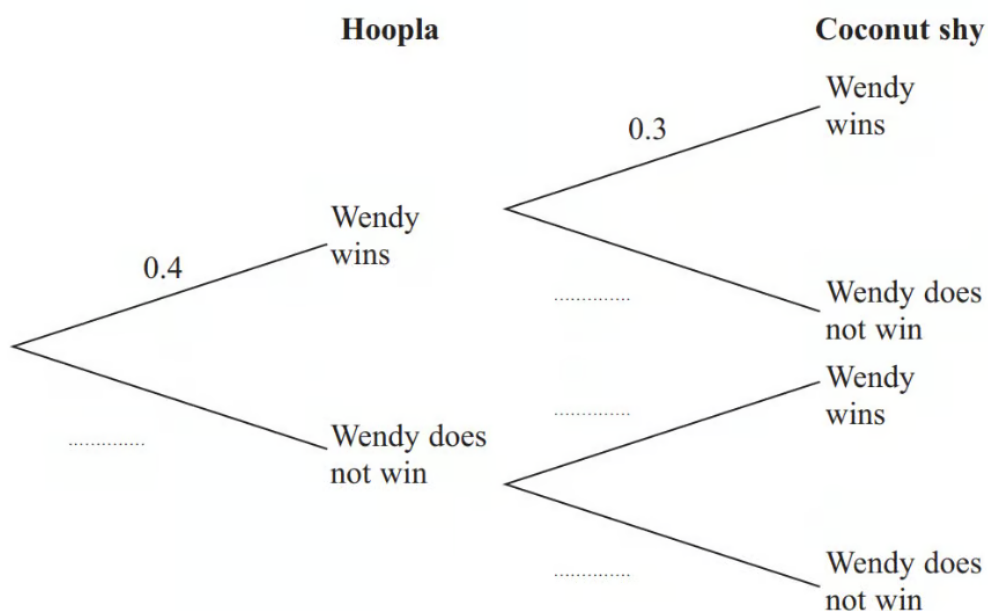
(3 marks)

- 4 (a)** Wendy goes to a fun fair.  
She has one go at Hoopla.  
She has one go on the Coconut shy.

The probability that she wins at Hoopla is 0.4

The probability that she wins on the Coconut shy is 0.3

Complete the probability tree diagram.



(2 marks)

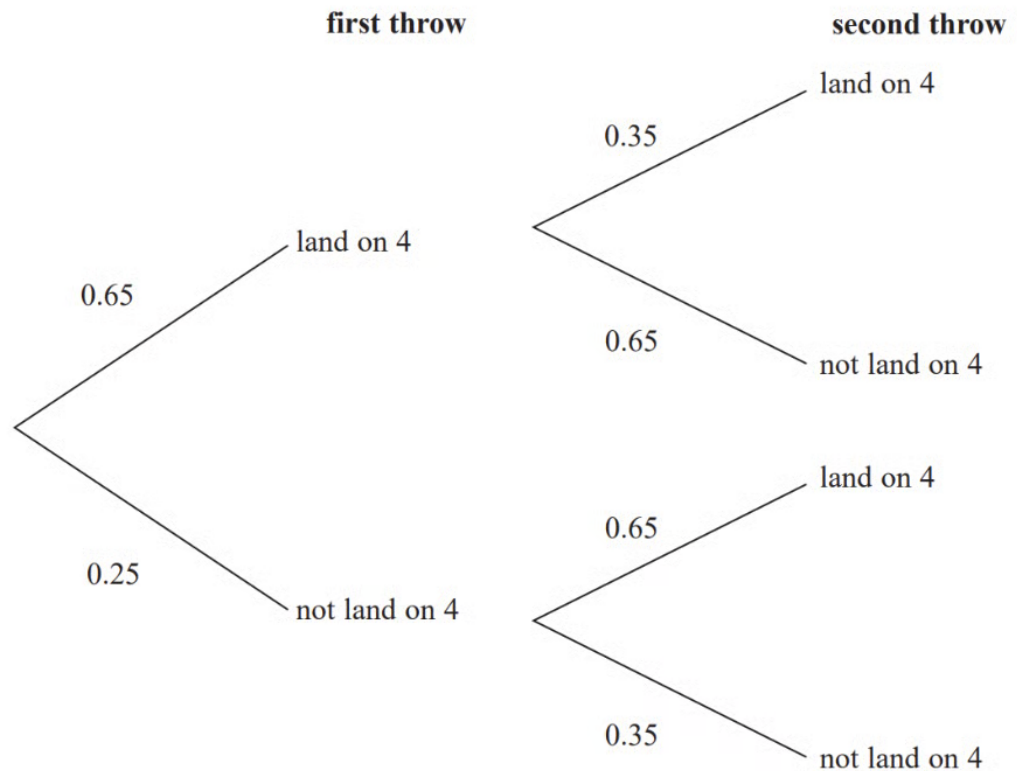
- (b)** Work out the probability that Wendy wins at Hoopla and also wins on the Coconut shy.

(2 marks)

- 5 When a biased 6-sided dice is thrown once, the probability that it will land on 4 is 0.65  
The biased dice is thrown twice.

Amir draws this probability tree diagram.

The diagram is **not** correct.



Write down **two** things that are wrong with the probability tree diagram.

(2 marks)

# Hard Questions

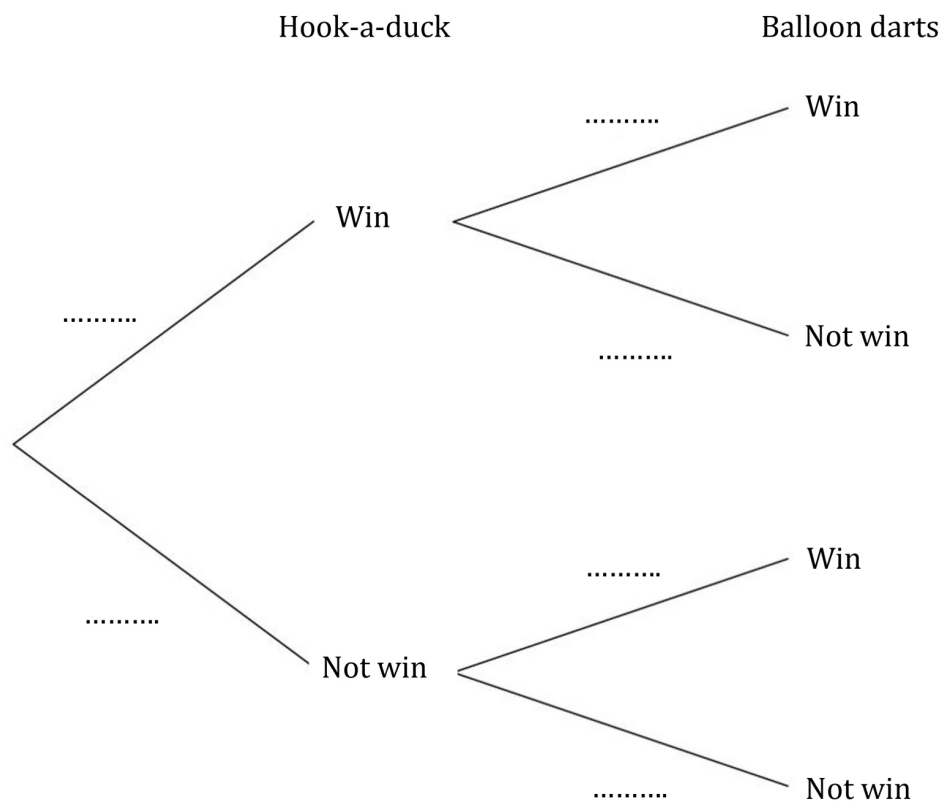
**1 (a)** Priya is at a fairground where she plays different games.

She plays 1 game of hook-a-duck, and then plays 1 game of balloon darts.

The probability of her winning in hook-a-duck is 0.6.

The probability of her winning in balloon darts is 0.45.

Complete the probability tree diagram below.



**(2 marks)**

**(b)** Find the probability that Priya wins **at least 1** game.

(3 marks)

2 The probability of finding a "shiny" card in a pack of trading cards is 0.4.

If 3 packs are purchased, find the probability of finding at least one "shiny" card.

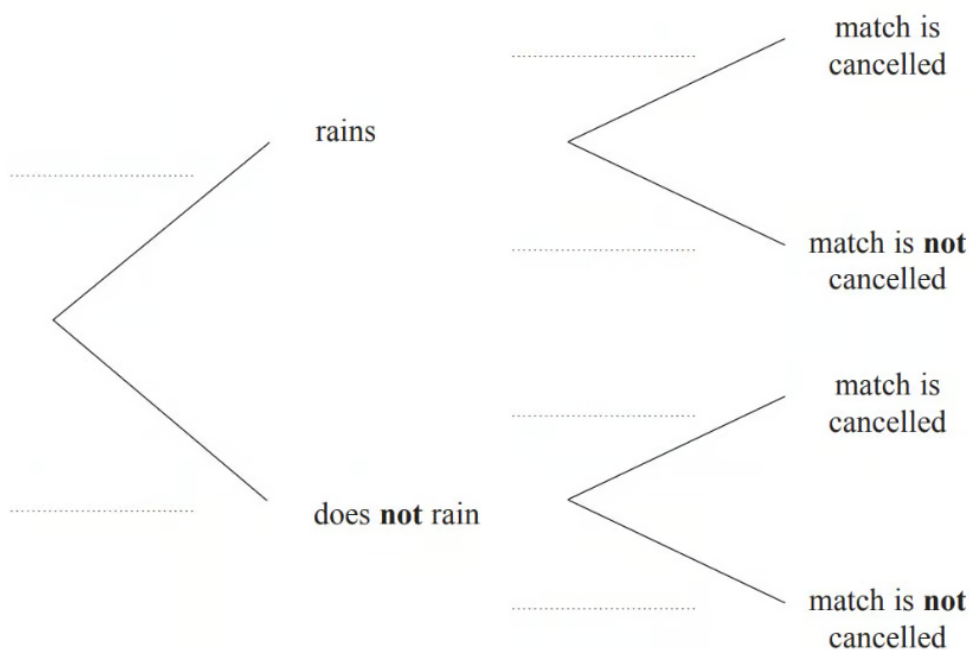
(3 marks)

3 (a) The probability that it will rain on a day in June is 0.2

When it rains the probability that my tennis match is cancelled is 0.7

When it does **not** rain, the probability that my tennis match is **not** cancelled is 0.95

Complete the probability tree diagram for this information.



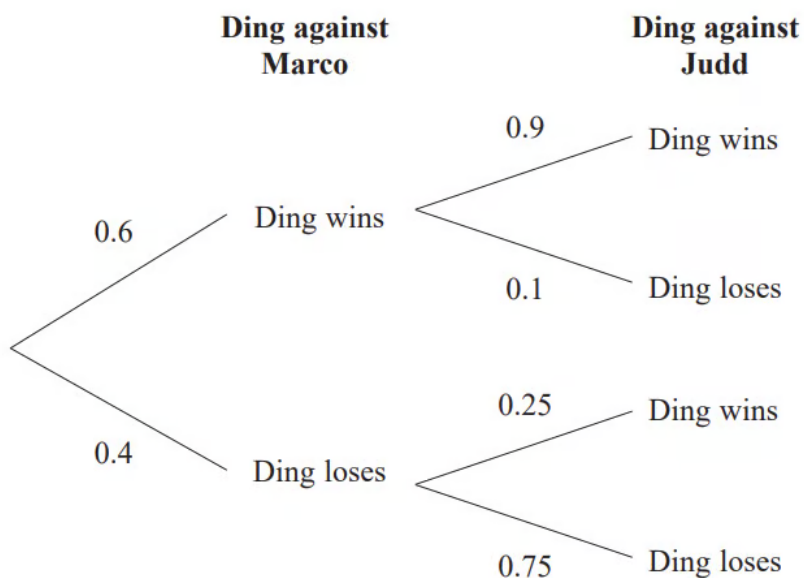
(3 marks)

- (b) Work out the probability that, on a day in June, it does **not** rain and my tennis match is cancelled.

(2 marks)

- 4 (a)** Ding is going to play one game of snooker against each of two of his friends, Marco and Judd.

The probability tree diagram gives information about the probabilities that Ding will win or lose each of these two games.



Work out the probability that Ding will win both games.

**(2 marks)**

- (b)** Work out the probability that Ding will win exactly one of the games.

**(3 marks)**