Chhetri Academy

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GCSE MATHS

Probability

Edexcel 1MA1 | Subtopic collection Topic 53

# Tree diagrams and combined events

## Foundation tier

Past paper question booklet

| 14 | 2012-2024 | Foundation |
| --- | --- | --- |
| question groups | available papers | tier |

### Before you begin

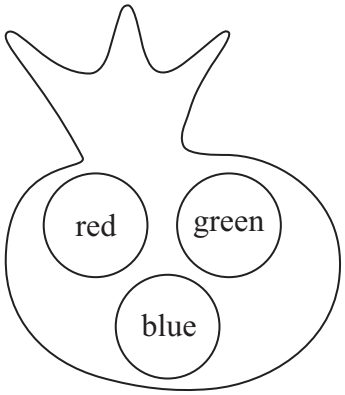
1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

**Name** _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

**6** There are 3 counters in a bag.

One counter is red.
One counter is green.
One counter is blue.




Mike takes at random a counter from the bag.
He puts the counter back in the bag.

Then Ellie takes at random a counter from the bag.

(a) Is Ellie more likely to take a blue counter from the bag than Mike?
You must explain your answer.

.....

.....

**(1)**

(b) Write a list of all the possible combinations of the two counters that Mike and Ellie can take.

.....

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**(2)**

(c) Find the probability that Mike takes a blue counter and then Ellie takes a green counter.

.....

**(1)**

**(Total for Question 6 is 4 marks)**

**5** A shop sells birthday cards.
Each card has a code on it.

The table shows each code and the price of the card.

| Code | Price (£) |
|---|---|
| A | 1.15 |
| B | 1.45 |
| C | 1.99 |
| D | 2.49 |
| E | 2.99 |

Ritu buys a card.
The card has code B on it.

(a) Write down the price of the card.

£.....
**(1)**

Mark buys two cards.

One card has code A on it.
The other card has code D on it.

(b) Work out the total amount Mark pays for the two cards.

£.....
**(2)**

Jennifer buys two cards.
The two cards have a total cost of £3.94

(c) Write down the code on each card Jennifer buys.

..... .....
**(2)**

**(Total for Question 5 is 5 marks)**

***6** Here is a menu for Joe's Cafe.

*Joe's Cafe*

| | | | |
|---|---|---|---|
| Sandwich | £3.25 | Tea | £1.55 |
| Pasty | £2.99 | Coffee | £1.95 |
| Cake | £2.25 | Orange | 89p |
| Soup | £3.19 | | |

Jim has four £2 coins.
He buys a sandwich and a pasty at Joe's Cafe.

Does Jim have enough money left to buy a coffee?

**(Total for Question 6 is 4 marks)**

**5** There are six counters in a bag.
Three counters are red, two counters are green and one counter is blue.



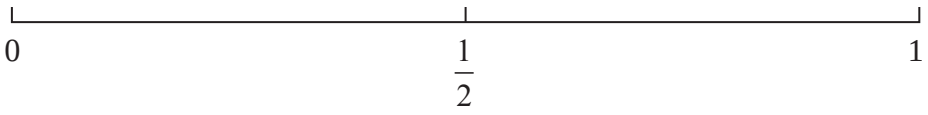

Nick takes at random a counter from the bag.

(a) Circle the word that best describes the likelihood that Nick takes a blue counter.

impossible unlikely even likely certain

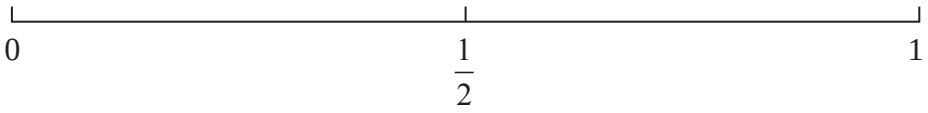
**(1)**

(b) On the probability scale, mark with a cross (×) the probability that Nick takes a red counter.




**(1)**

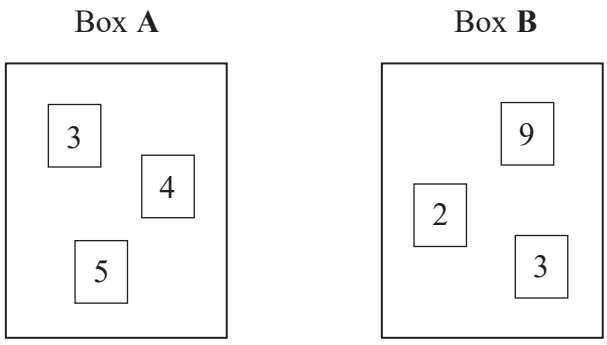
(c) On the probability scale, mark with a cross (×) the probability that Nick takes a white counter.




**(1)**

**(Total for Question 5 is 3 marks)**

**17** There are 3 cards in Box **A** and 3 cards in Box **B**.
There is a number on each card.




Ryan takes at random a card from Box **A** and a card from Box **B**.
He adds together the numbers on the two cards to get a total score.

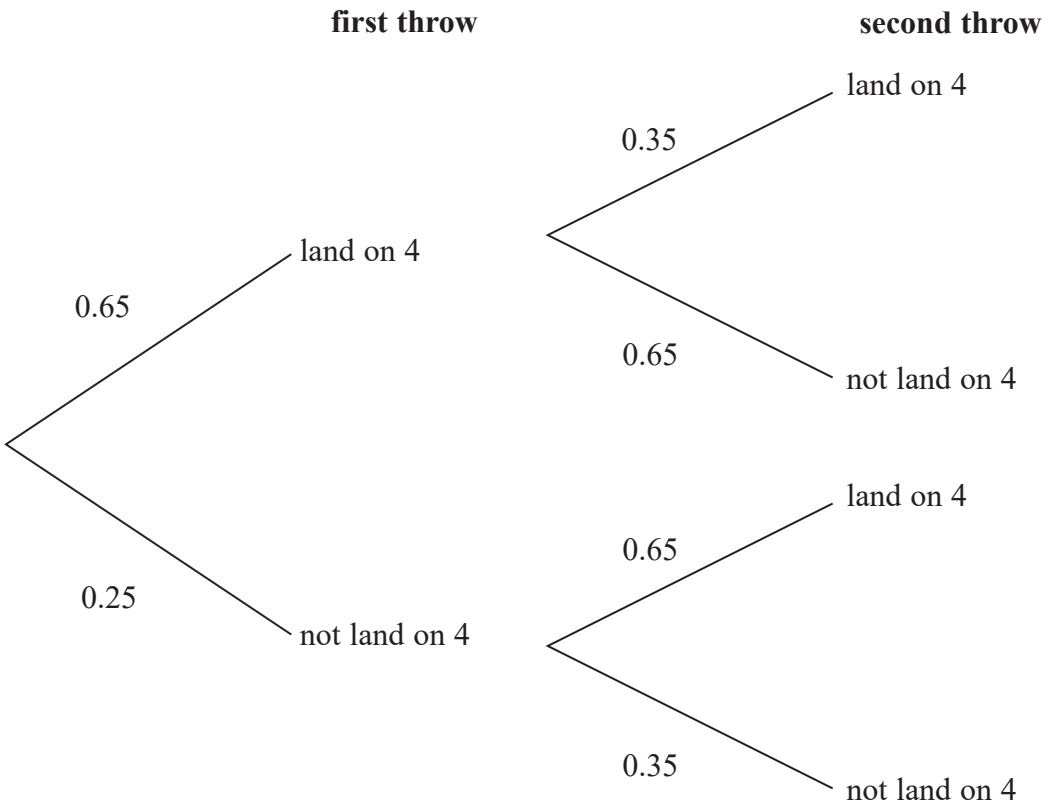
Work out the probability that the total score is an odd number.

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**(Total for Question 17 is 2 marks)**

**22** 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.

1 .....

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2 .....

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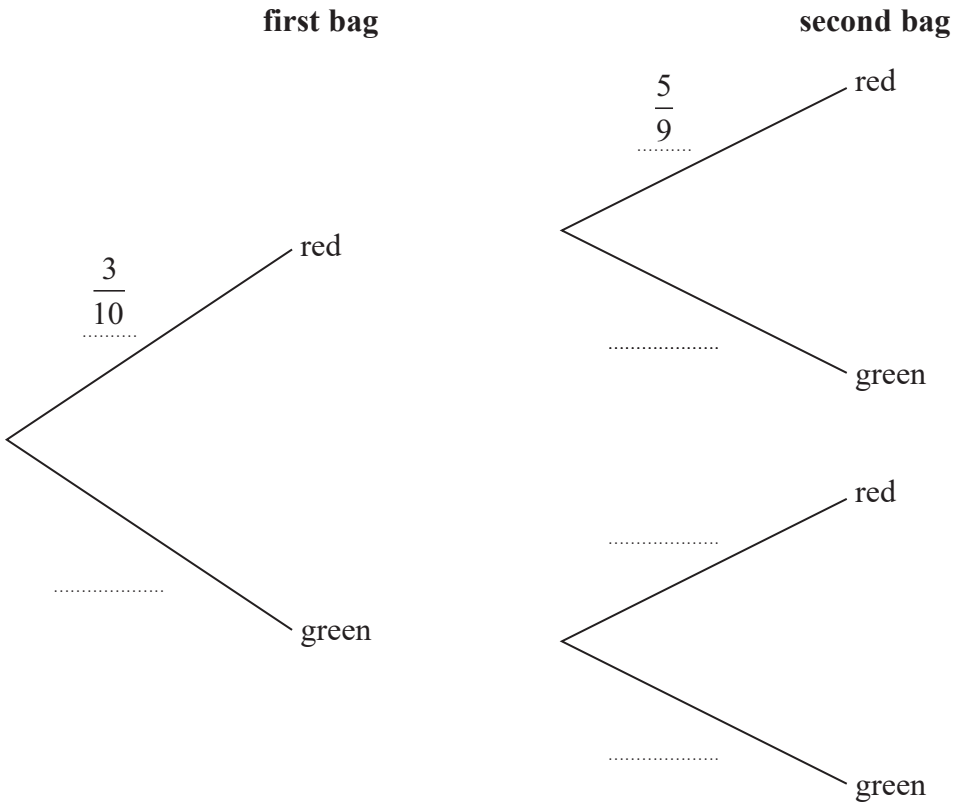
**(Total for Question 22 is 2 marks)**

**27** Amina has two bags.

In the first bag there are 3 red balls and 7 green balls.
In the second bag there are 5 red balls and 4 green balls.

Amina takes at random a ball from the first bag.
She then takes at random a ball from the second bag.

(a) Complete the probability tree diagram.




**(2)**

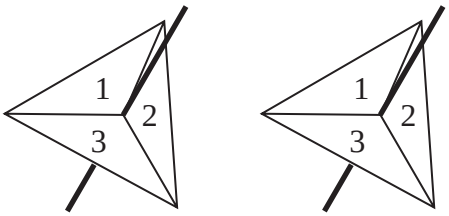
(b) Work out the probability that Amina takes two red balls.

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**(2)**

**(Total for Question 27 is 4 marks)**

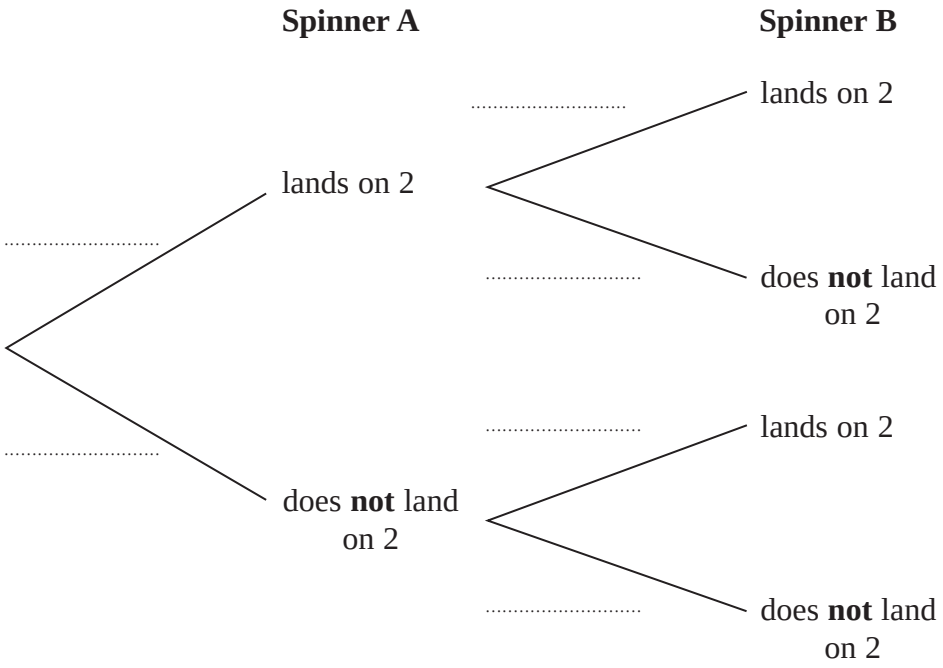
**27** Amanda has two fair 3-sided spinners.




**Spinner A** **Spinner B**

Amanda spins each spinner once.

(a) Complete the probability tree diagram.




**(2)**

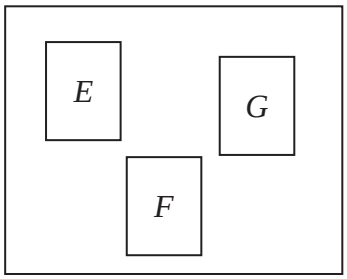
(b) Work out the probability that Spinner A lands on 2 and Spinner B does **not** land on 2

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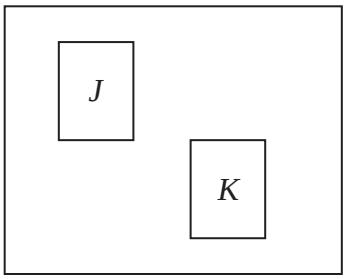
**(2)**

**(Total for Question 27 is 4 marks)**

**7** There are three cards in bag **A** and two cards in bag **B**.
There is a letter on each card.



Bag **A**



Bag **B**

James takes a card from bag **A** and then a card from bag **B**.

List all the possible outcomes.

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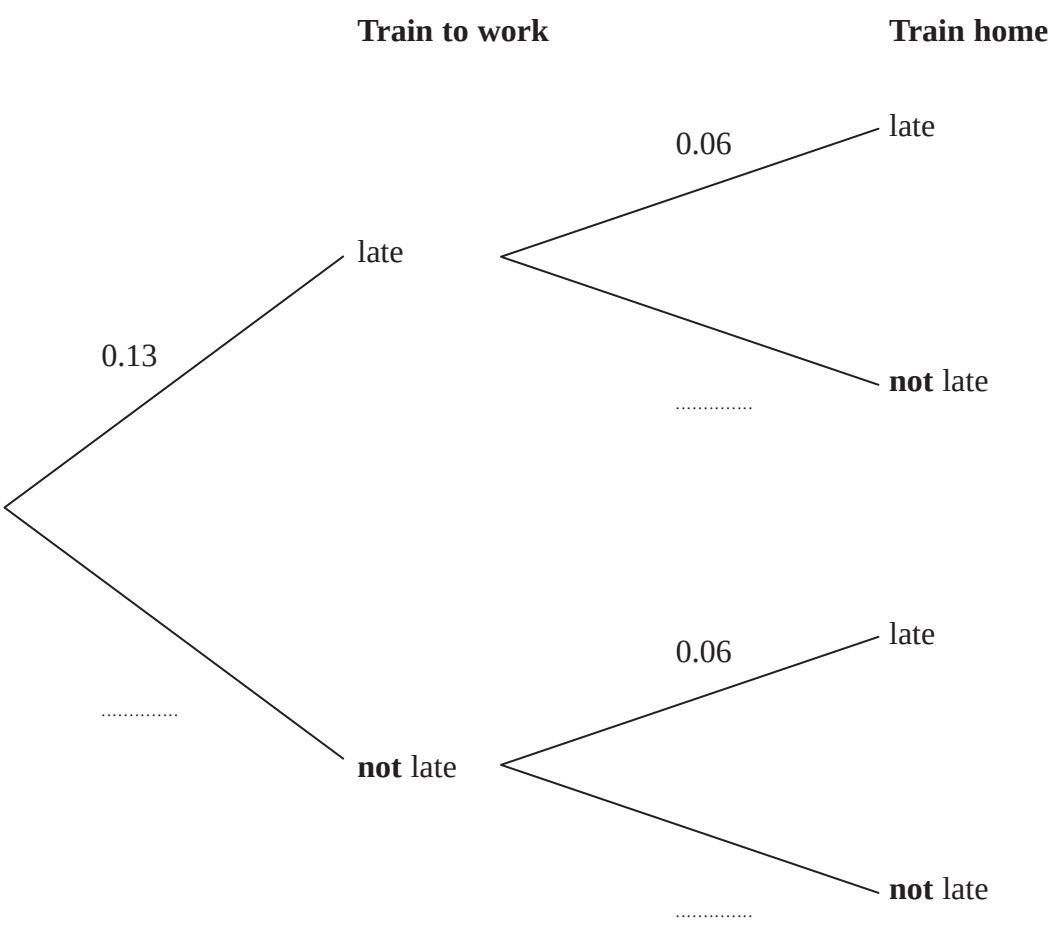
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**(Total for Question 7 is 2 marks)**

**20** Lorena gets a train at the same time each morning to go to work.
She gets a train at the same time each evening to come home.

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

(a) Complete the probability tree diagram.




**(2)**

For a day that Lorena goes to work,

(b) work out the probability that the train to work and the train home will both arrive late.

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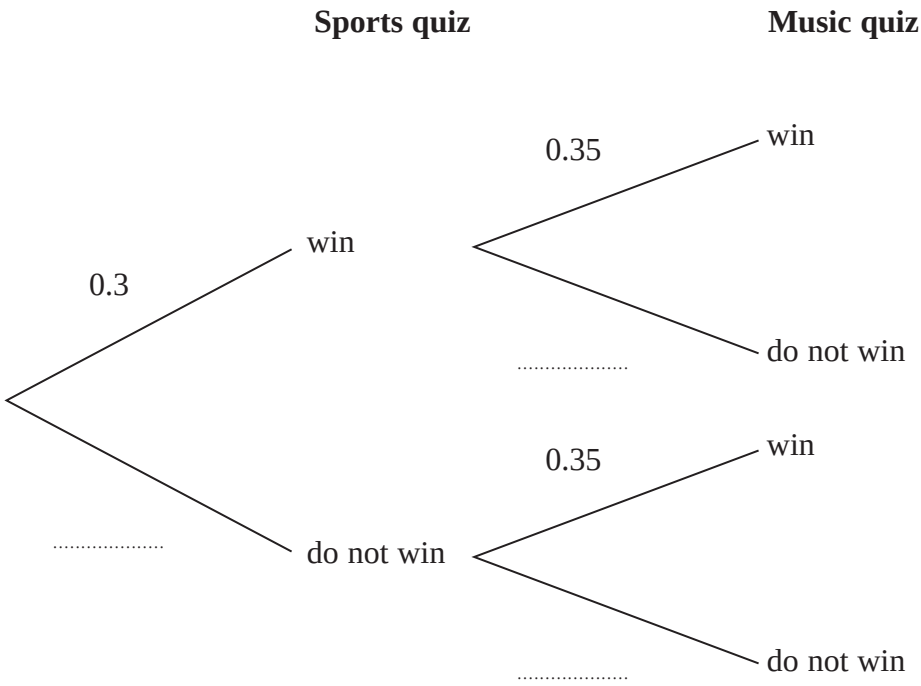
**(2)**

**(Total for Question 20 is 4 marks)**

**26** One weekend the Keddie family is going to do a sports quiz and a music quiz.

The probability that the family will win the sports quiz is 0.3
The probability that the family will win the music quiz is 0.35

(a) Complete the probability tree diagram.




**(2)**

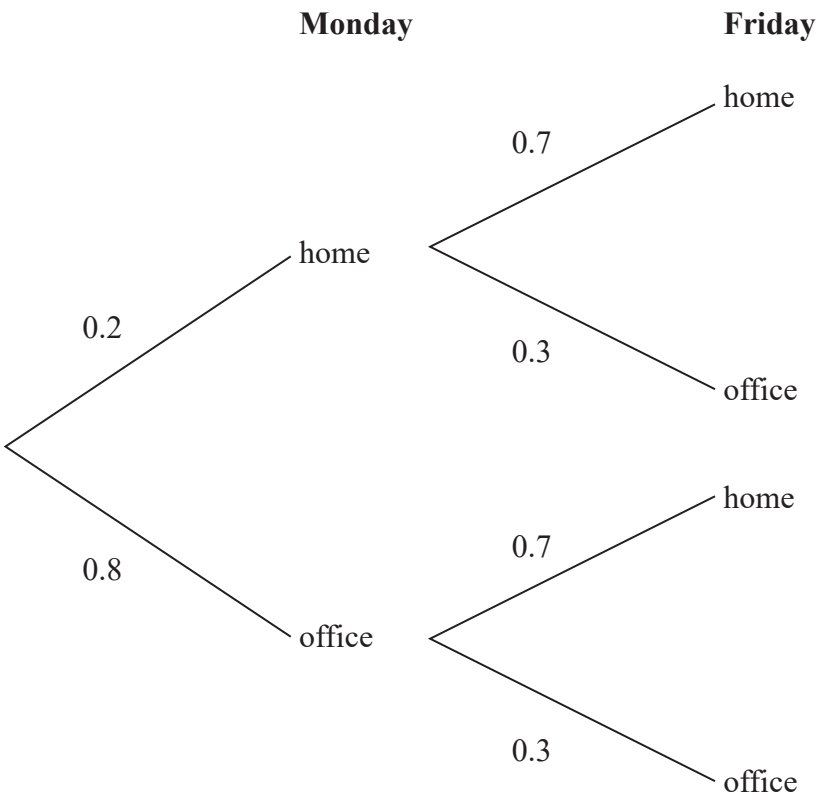
(b) Work out the probability that the Keddie family will win both the sports quiz and the music quiz.

.....

**(2)**

**(Total for Question 26 is 4 marks)**

**31** The probability tree diagram shows the probabilities that Shayla will work at home or will work at the office on two days next week.




Work out the probability that Shayla will work at home on Monday and work at the office on Friday.

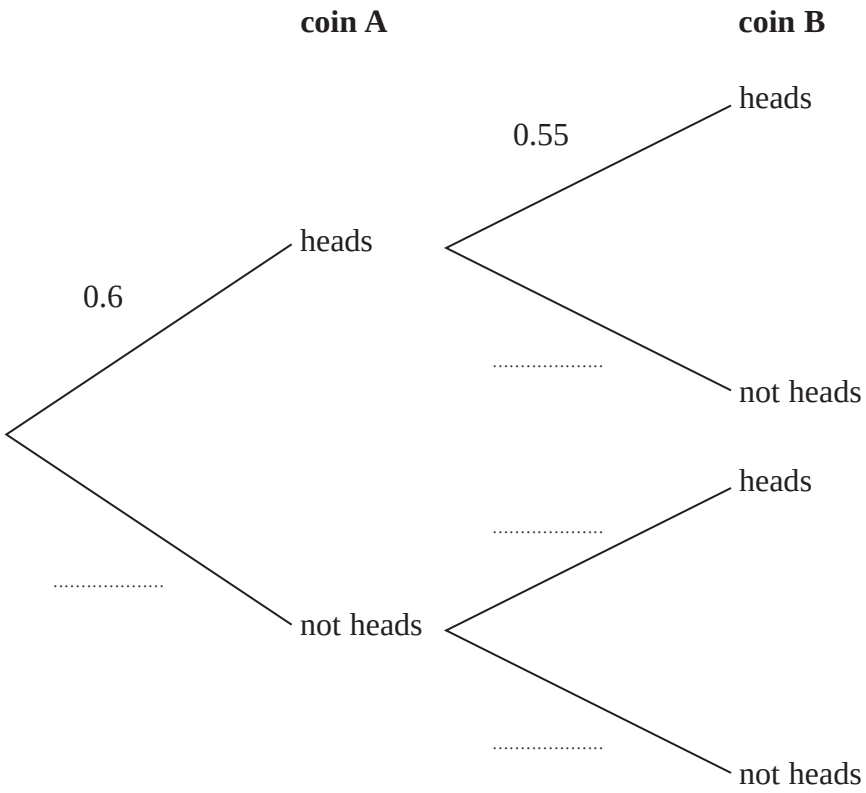
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**(Total for Question 31 is 2 marks)**

**27** Tim has two biased coins, coin **A** and coin **B**.
He is going to throw both coins.

The probability that coin **A** will land on heads is 0.6
The probability that coin **B** will land on heads is 0.55

(a) Complete the probability tree diagram.




**(2)**

Tim throws coin **A** once and he throws coin **B** once.

(b) Work out the probability that both coins land on heads.

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**(2)**

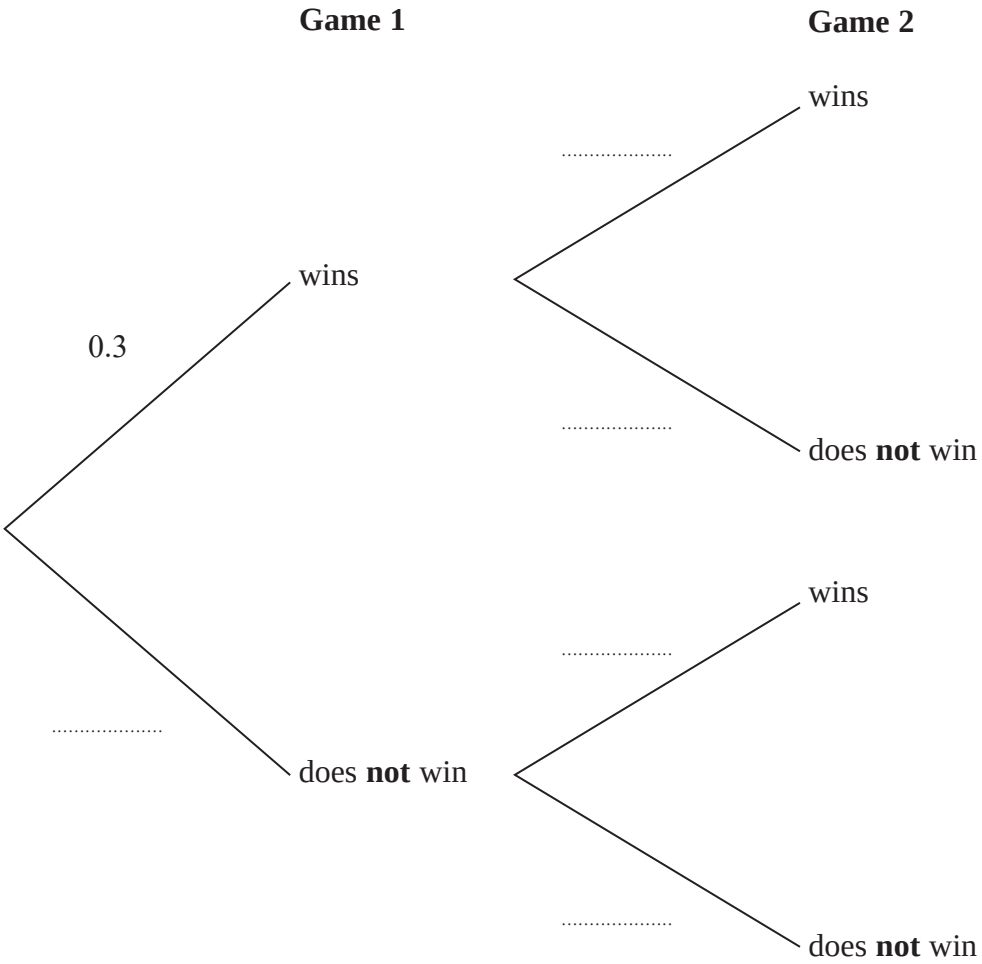
**(Total for Question 27 is 4 marks)**

**20** Dan is playing cards.

The probability that he will win a game of cards is 0.3

Dan plays two games of cards.

(a) Complete the probability tree diagram.




**(2)**

(b) Work out the probability that Dan does **not** win either game.

.....

**(2)**

**(Total for Question 20 is 4 marks)**