# Tree Diagrams

## Question Paper 1

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|---|---|
| Level | IGCSE |
| Subject | Maths |
| Exam Board | Edexcel |
| Topic | Handling Data Statistics |
| Sub Topic | Tree Diagrams(Probability) |
| Booklet | Question Paper 1 |

**Time Allowed:** **56 minutes**

**Score:** **/46**

**Percentage:** **/100**

**Grade Boundaries:**

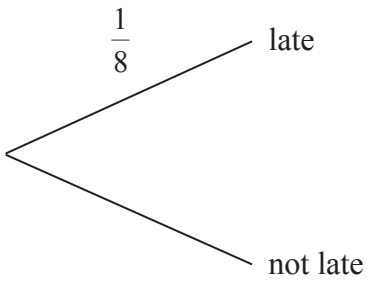
| A* | A | B | C | D | E | U |
|---|---|---|---|---|---|---|
| >85% | 75% | 70% | 60% | 55% | 50% | <50% |

1 Alan has to attend a meeting on Monday and on Tuesday.

The probability that he is late for a meeting is $\frac{1}{8}$

(a) Complete the probability tree diagram.

**(3)**




(b) Calculate the probability that Alan is late for at least one of these meetings.

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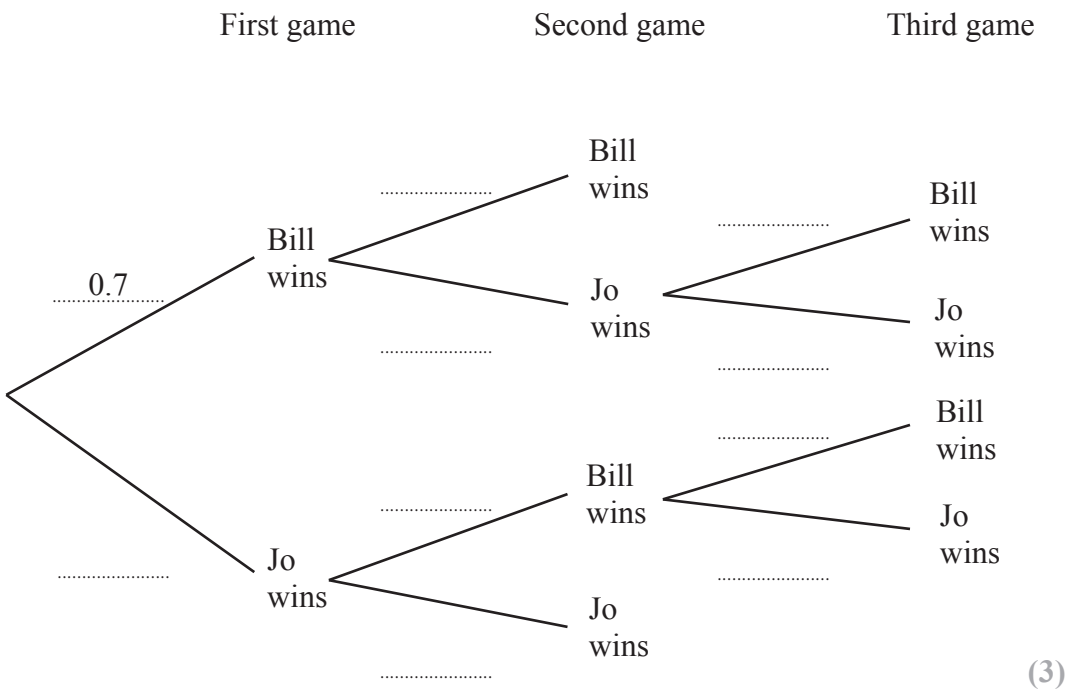
**(3)**

**(Total for Question 1 is 6 marks)**

**2** Bill and Jo play some games of table tennis.
The probability that Bill wins the first game is 0.7
When Bill wins a game, the probability that he wins the next game is 0.8
When Jo wins a game, the probability that she wins the next game is 0.5

The first person to win two games wins the match.

(a) Complete the probability tree diagram.




**(3)**

(b) Calculate the probability that Bill wins the match.

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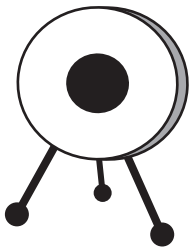
**(3)**

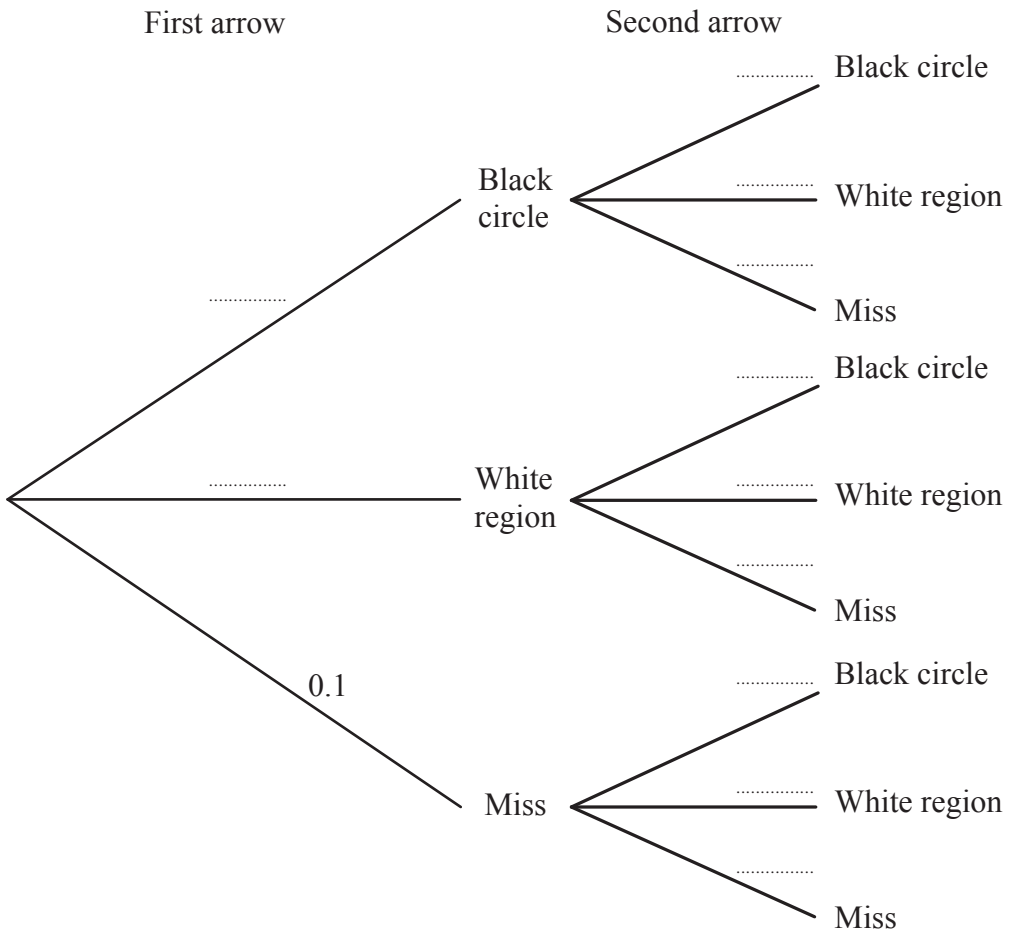
**(Total for Question 2 is 6 marks)**

**3** A target has a black circle and a white region.
Arrows can hit the black circle, the white region or miss the target.



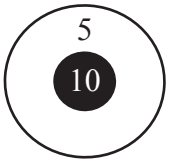
Peter shoots two arrows at the target.
On each shot, the probability that Peter's arrow misses the target is 0.1
On each shot, the probability that Peter's arrow hits the white region is twice the probability that it hits the black circle.

(a) Complete the probability tree diagram for Peter's two arrows.




**(3)**

(b) An arrow which hits the black circle scores 10 points.
An arrow which hits the white region scores 5 points.
An arrow which misses the target scores 0 points.




Calculate the probability that Peter scores exactly 10 points with his 2 arrows.

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**(3)**

**(Total for Question 3 is 6 marks)**

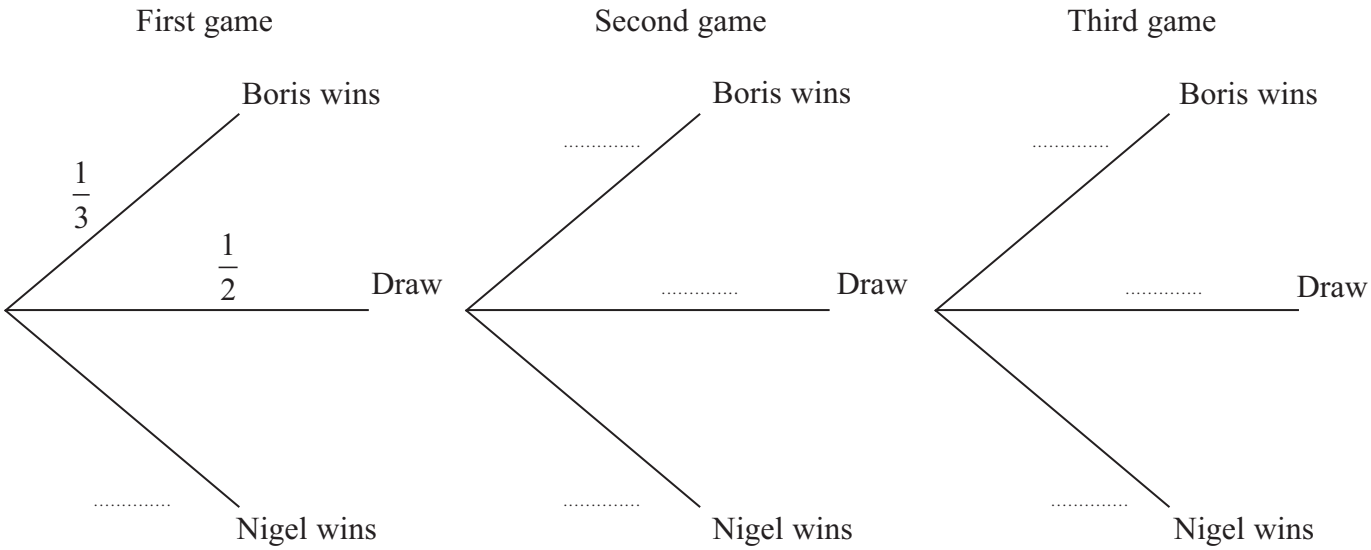
**4** Boris and Nigel play games of chess against each other in a match.
In each game, Boris wins or Nigel wins or the game is a draw.

When a player wins a game, he wins the match.
When a game is a draw, the players play another game against each other.
Boris and Nigel play a maximum of 3 games.

The probability that Boris wins a game is $\frac{1}{3}$

The probability that a game is a draw is $\frac{1}{2}$

(a) Complete the probability tree diagram.




**(3)**

(b) Calculate the probability that Boris wins the match.

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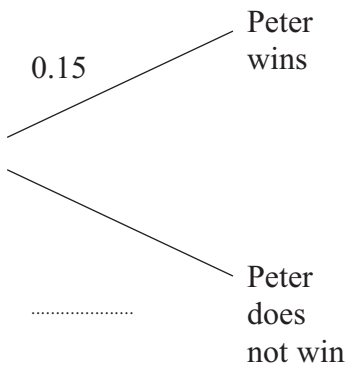
**(3)**

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

**5** Peter and John play two games of badminton against each other.
For each game, the probability that Peter wins is 0.15

(a) Complete the probability tree diagram.




**(3)**

(b) Calculate the probability that Peter wins both games.

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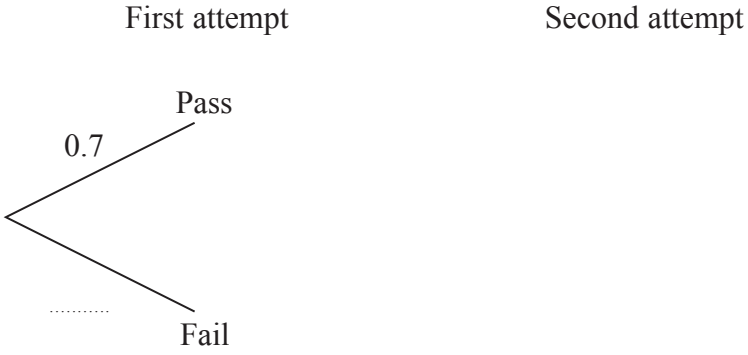
**(2)**

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

**6** Peter wants to pass his driving test.
The probability that he passes at his first attempt is 0.7
When Peter passes his driving test, he does not take it again.
If he fails, the probability that he passes at the next attempt is 0.8

(a) Complete the probability tree diagram for Peter's first two attempts.




**(2)**

(b) Calculate the probability that Peter needs exactly two attempts to pass his driving test.

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**(2)**

(c) Calculate the probability that Peter passes his driving test at his third or fourth attempt.

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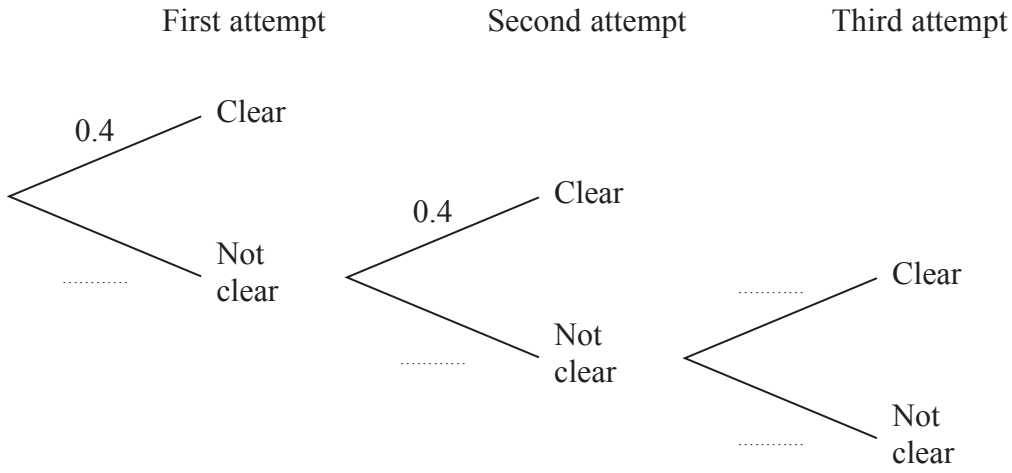
**(3)**

**(Total for Question 6 is 7 marks)**

**7** Hugo competes in the high jump at a school athletics competition.
He has up to 3 attempts to clear the bar at each height.
When he clears the bar, he does not have another attempt at that height.

When the bar is set at a height of 1.60 metres, the probability that Hugo will clear the bar on any attempt is 0.4
The probability tree diagram shows the possible outcomes of Hugo's attempts at 1.60 metres.




(a) Complete the probability tree diagram to show the four missing probabilities.

**(1)**

(b) Work out the probability that Hugo does not clear the bar on his first two attempts and then does clear the bar on his third attempt at 1.60 metres.

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**(2)**

Hugo clears the bar at 1.60 metres and the height is raised to 1.65 metres.
He has up to three attempts to clear the bar at 1.65 metres.

When the bar is set at a height of 1.65 metres, the probability that Hugo will clear the bar on any attempt is 0.3

(c) Find the probability that Hugo clears the bar at 1.65 metres.

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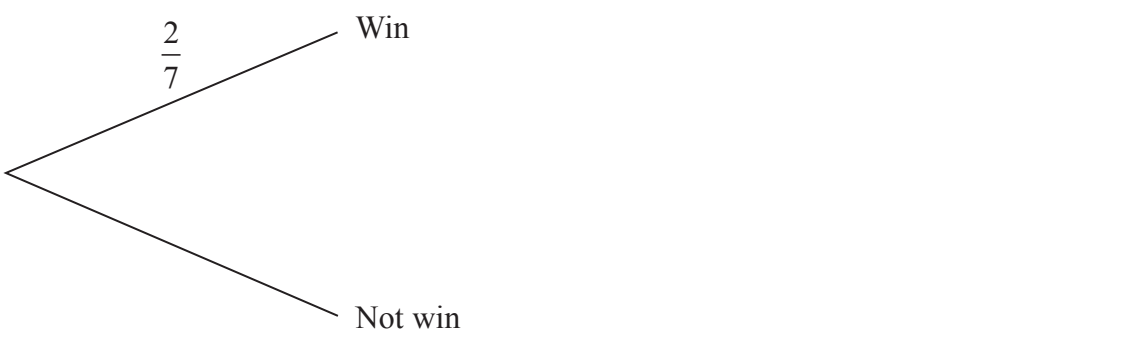
**(3)**

**(Total for Question 7 is 6 marks)**

**8** Amberish plays two games of tennis.

Each time he plays a game of tennis, the probability that he will win is $\frac{2}{7}$

(a) Complete the probability tree diagram.




**(3)**

(b) Calculate the probability that Amberish wins at least one of the two games of tennis.

**(3)**

**(Total for Question 8 is 6 marks)**