Solutions by
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GCSE (9-1) Grade 5
Tree Diagrams

Unfinished. Please support to inspire me on.

Instructions

Use **black** ink or ball-point pen.
Fill in the boxes at the top of this page with your name.
Answer **all** questions.
Answer the questions in the spaces provided
– there may be more space than you need.
Show all your working out

Information

The marks for **each** question are shown in brackets.
use this as a guide as to how much time to spend on each question.
Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed

Advice

Read each question carefully before you start to answer it
Attempt every question
Check your answers if you have time at the end

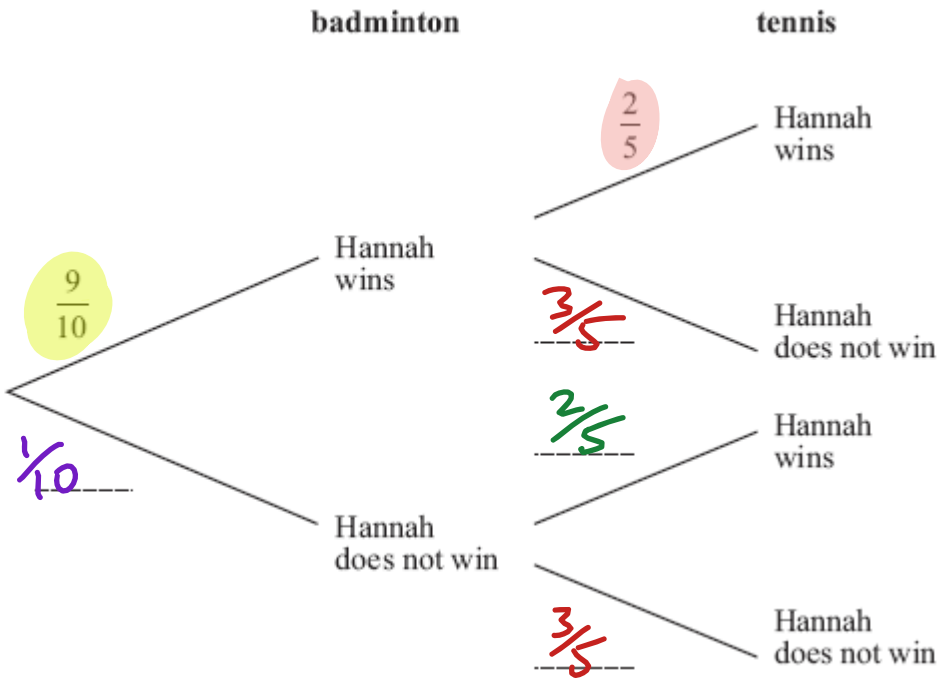
1. Hannah is going to play one badminton match and one tennis match.

The probability that she will win the badminton match is $\frac{9}{10}$ → $\frac{1}{10}$ she loses

The probability that she will win the tennis match is $\frac{2}{5}$ → $\frac{3}{5}$ she loses

(a) Complete the probability tree diagram.

(2)



(b) Work out the probability that Hannah will win **both** matches.

(2)

$\frac{9}{10} \times \frac{2}{5} = \frac{18}{50}$ or $\frac{9}{25}$

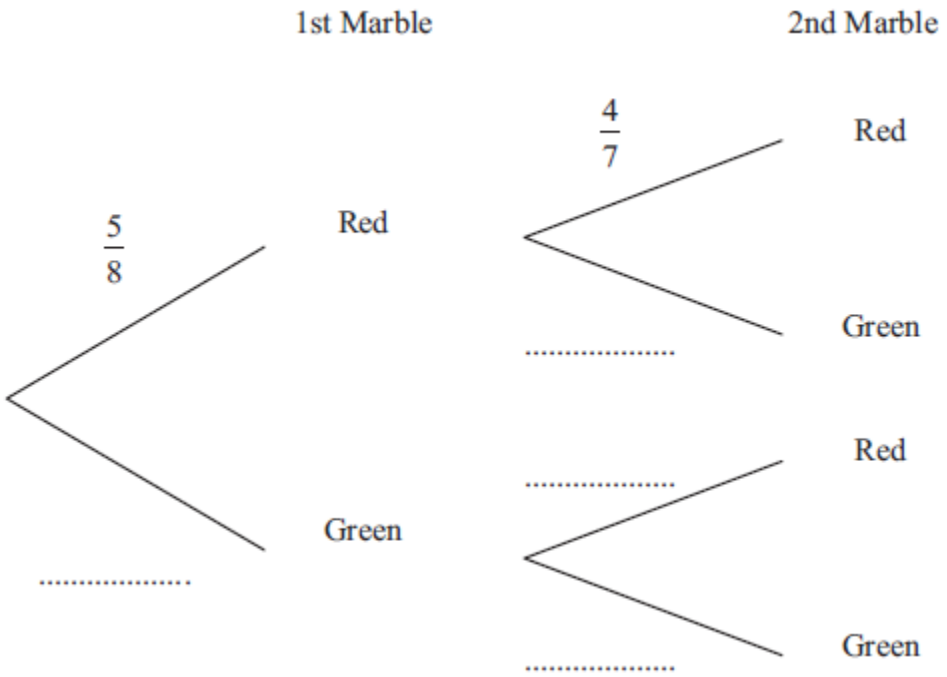
(4 marks)

2. There are only red marbles and green marbles in a bag.
There are 5 red marbles and 3 green marbles.

Dwayne takes at random a marble from the bag.
He does not put the marble back in the bag.

Dwayne takes at random a second marble from the bag.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Dwayne takes marbles of different colours.

.....

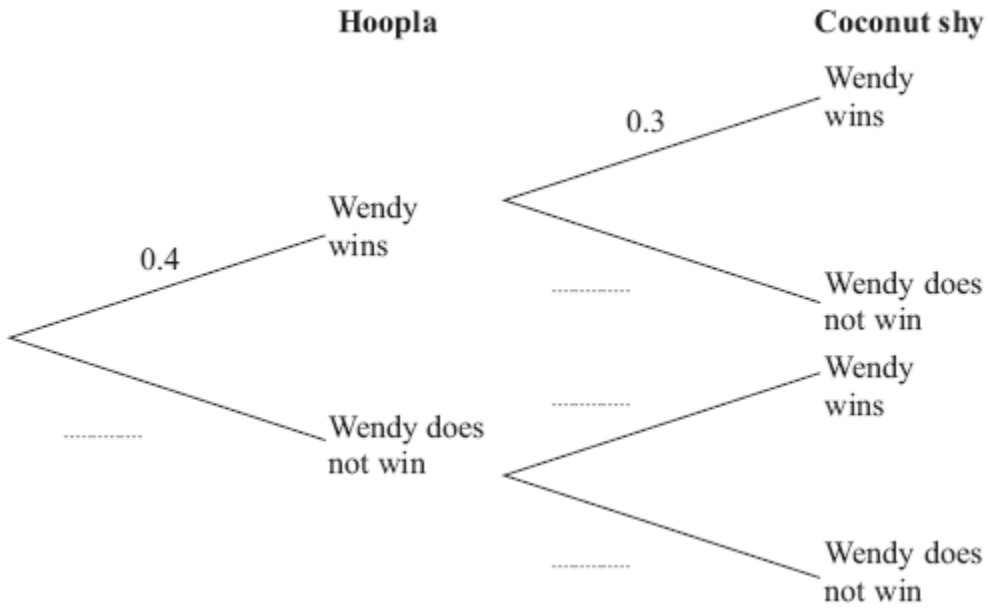
(3)

(5 marks)

3. 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

(a) Complete the probability tree diagram.



(2)

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

.....

(2)

(4 marks)

---

4. There are 5 red pens, 3 blue pens and 2 green pens in a box.

Gary takes at random a pen from the box and gives the pen to his friend.
Gary then takes at random another pen from the box.

Work out the probability that both pens are the same colour.

.....

(4 marks)

5. Carolyn has 20 biscuits in a tin.

She has

12 plain biscuits
5 chocolate biscuits
3 ginger biscuits

Carolyn takes at random two biscuits from the tin.

Work out the probability that the two biscuits were **not** the same type.

.....

(4 marks)

6. Here are seven tiles.



Jim takes at random a tile.
He does **not** replace the tile.

Jim then takes at random a second tile.

(a) Calculate the probability that both the tiles Jim takes have the number 1 on them.

.....

(2)

(b) Calculate the probability that the number on the second tile Jim takes is greater than the number on the first tile he takes.

.....

(3)

(5 marks)

7. There are three different types of sandwiches on a shelf.

There are

4 egg sandwiches,
5 cheese sandwiches
and 2 ham sandwiches.

Erin takes at random 2 of these sandwiches.

Work out the probability that she takes 2 different types of sandwiches.

.....

(5 marks)

8. Julie does a statistical experiment. She throws a dice 600 times.
She scores six 200 times.

(a) Is the dice fair? Explain your answer.

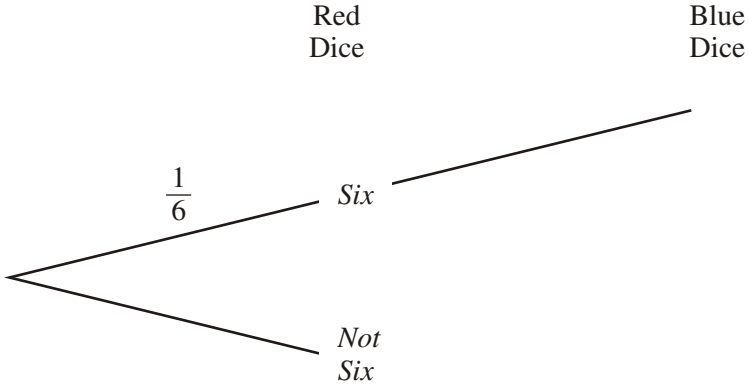
.....

.....

(1)

Julie then throws a fair red dice once and a fair blue dice once.

(b) Complete the probability tree diagram to show the outcomes.
Label clearly the branches of the probability tree diagram.
The probability tree diagram has been started in the space below.



(3)
(Total 4 marks)

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9. Julie does a statistical experiment. She throws a dice 600 times.
She scores six 200 times.

(a) Is the dice fair? Explain your answer.

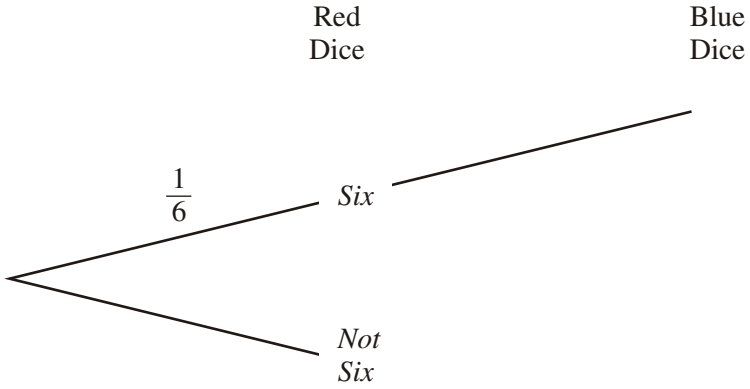
.....

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(1)

Julie then throws a fair red dice once and a fair blue dice once.

(b) Complete the probability tree diagram to show the outcomes.
Label clearly the branches of the probability tree diagram.
The probability tree diagram has been started in the space below.



(3)

(c) (i) Julie throws a fair red dice once and a fair blue dice once. Calculate the probability that Julie gets a six on both the red dice and the blue dice.

.....

(ii) Calculate the probability that Julie gets at least one six.

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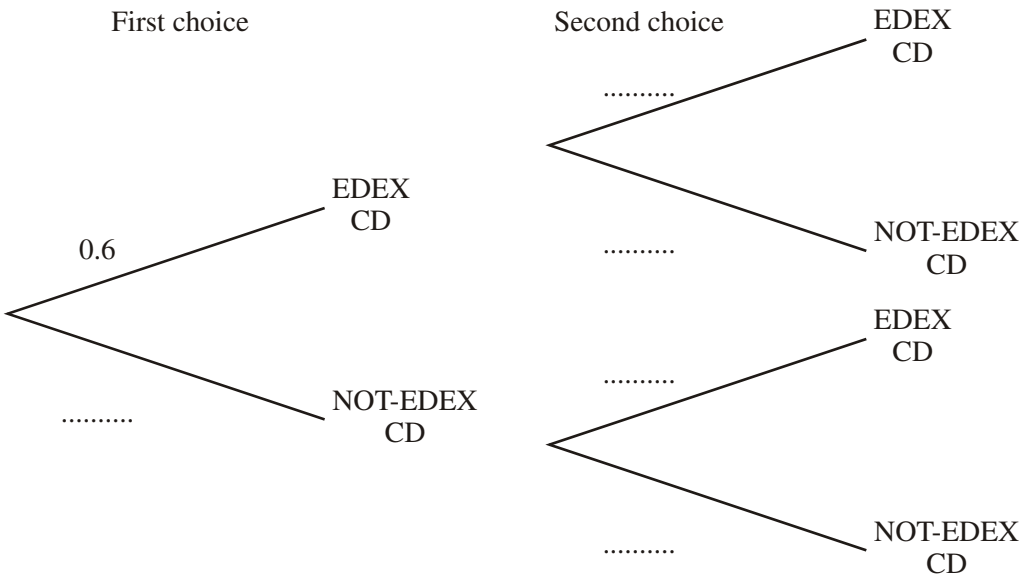
(5)
(Total 9 marks)

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10. Amy has 10 CDs in a CD holder.
Amy's favourite group is Edex.
She has 6 Edex CDs in the CD holder.

Amy takes one of these CDs at random.
She writes down whether or not it is an Edex CD.
She puts the CD back in the holder.
Amy again takes one of these CDs at random.

(a) Complete the probability tree diagram.



(2)

Amy had 30 CDs.
The mean playing time of these 30 CDs was 42 minutes.

Amy sold 5 of her CDs.
The mean playing time of the 25 CDs left was 42.8 minutes.

(b) Calculate the mean playing time of the 5 CDs that Amy sold.

..... minutes

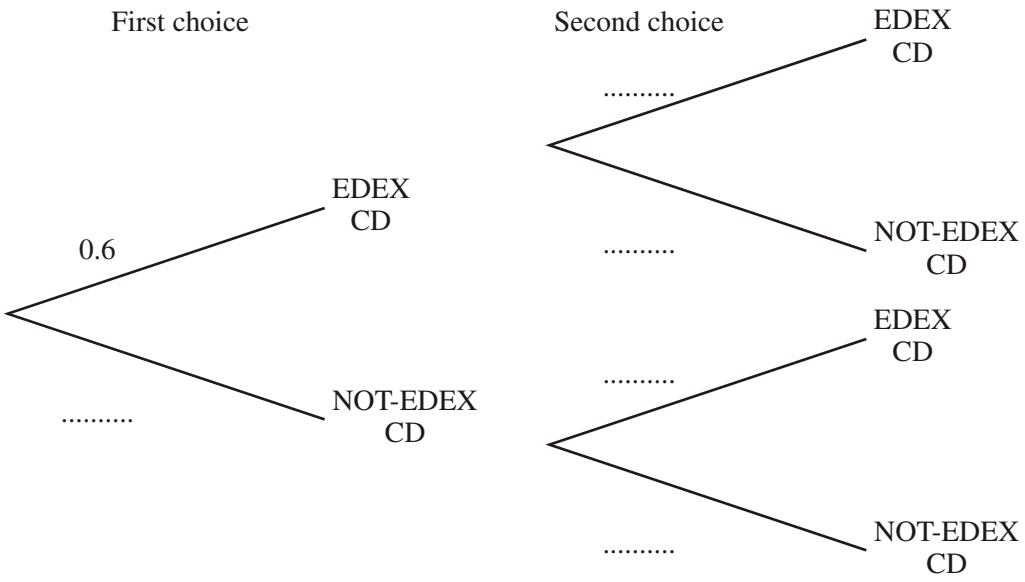
(3)
(Total 5 marks)

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11. Amy has 10 CDs in a CD holder.
Amy's favourite group is Edex.
She has 6 Edex CDs in the CD holder.

Amy takes one of these CDs at random.
She writes down whether or not it is an Edex CD.
She puts the CD back in the holder.
Amy again takes one of these CDs at random.

(a) Complete the probability tree diagram.



(2)

(b) Find the probability that Amy will pick two Edex CDs.

.....

(2)

Amy had 30 CDs.
The mean playing time of these 30 CDs was 42 minutes.

Amy sold 5 of her CDs.
The mean playing time of the 25 CDs left was 42.8 minutes.

(c) Calculate the mean playing time of the 5 CDs that Amy sold.

..... minutes

(3)
(Total 7 marks)

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12. In a game of chess, you can win, draw or lose.

Gary plays two games of chess against Mijan.

The probability that Gary will win any game against Mijan is 0.55
The probability that Gary will win draw game against Mijan is 0.3

(a) Work out the probability that Gary will win **exactly** one of the two games against Mijan.

.....

(3)

In a game of chess, you score

$$\begin{matrix} 1 \text{ point for a win} \\ \frac{1}{2} \text{ point for a draw,} \\ 0 \text{ points for a loss.} \end{matrix}$$

(b) Work out the probability that after two games, Gary's total score will be the same as Mijan's total score.

.....

(3)
(Total 6 marks)

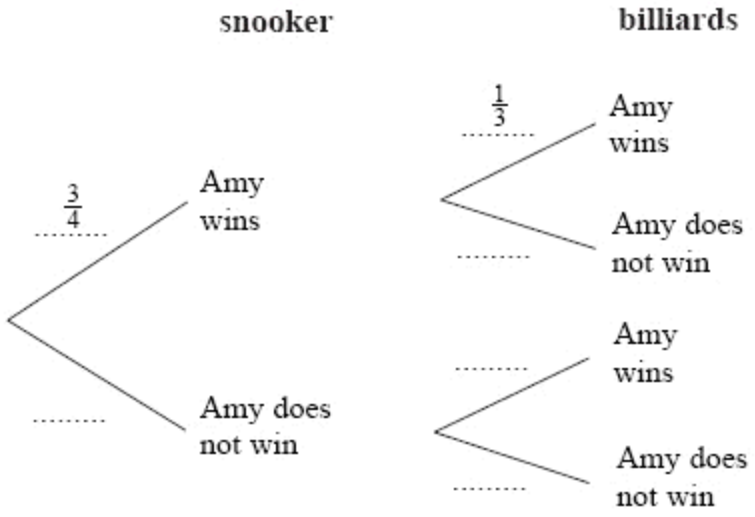
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13. Amy is going to play one game of snooker and one game of billiards.

The probability that she will win the game of snooker is $\frac{3}{4}$

The probability that she will win the game of billiards is $\frac{1}{3}$

Complete the probability tree diagram.



(Total 2 marks)

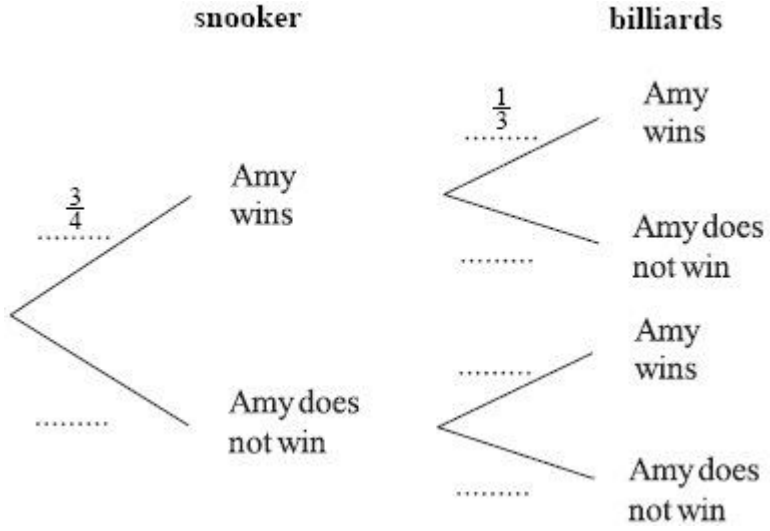
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14. Amy is going to play one game of snooker and one game of billiards.

The probability that she will win the game of snooker is $\frac{3}{4}$

The probability that she will win the game of billiards is $\frac{1}{3}$

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Amy will win **exactly** one game.

……

(3)

Amy played one game of snooker and one game of billiards on a number of Fridays.
She won at **both** snooker and billiards on 21 Fridays.

(c) Work out an estimate for the number of Fridays on which Amy did not win either game.

……

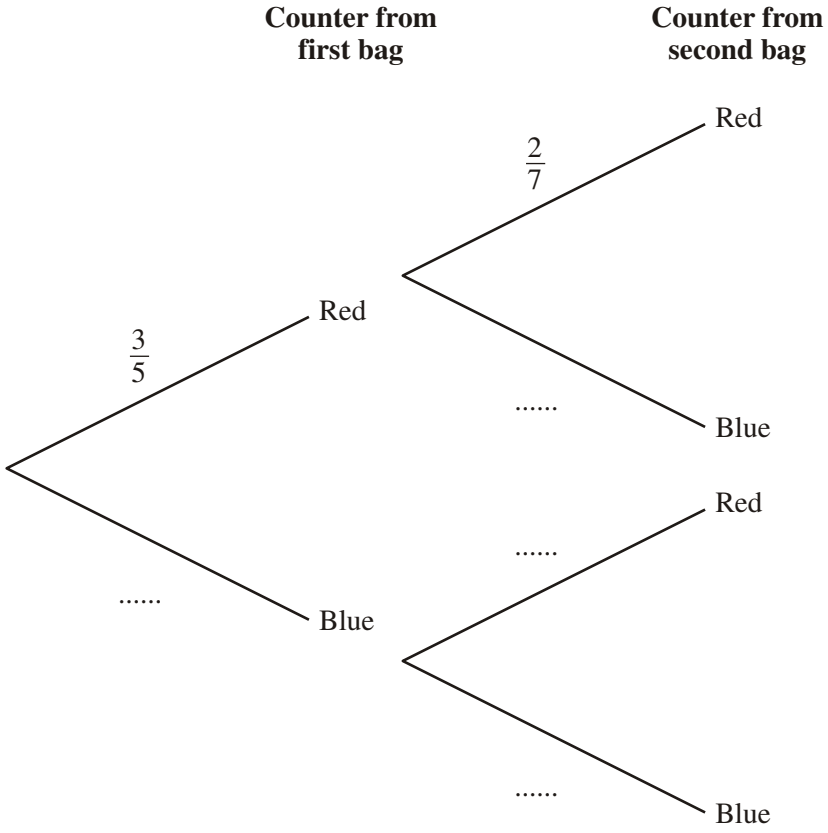
(3)
(Total 8 marks)

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15. Loren has two bags.
The first bag contains 3 red counters and 2 blue counters.
The second bag contains 2 red counters and 5 blue counters.

Loren takes one counter at random from each bag.

Complete the probability tree diagram.



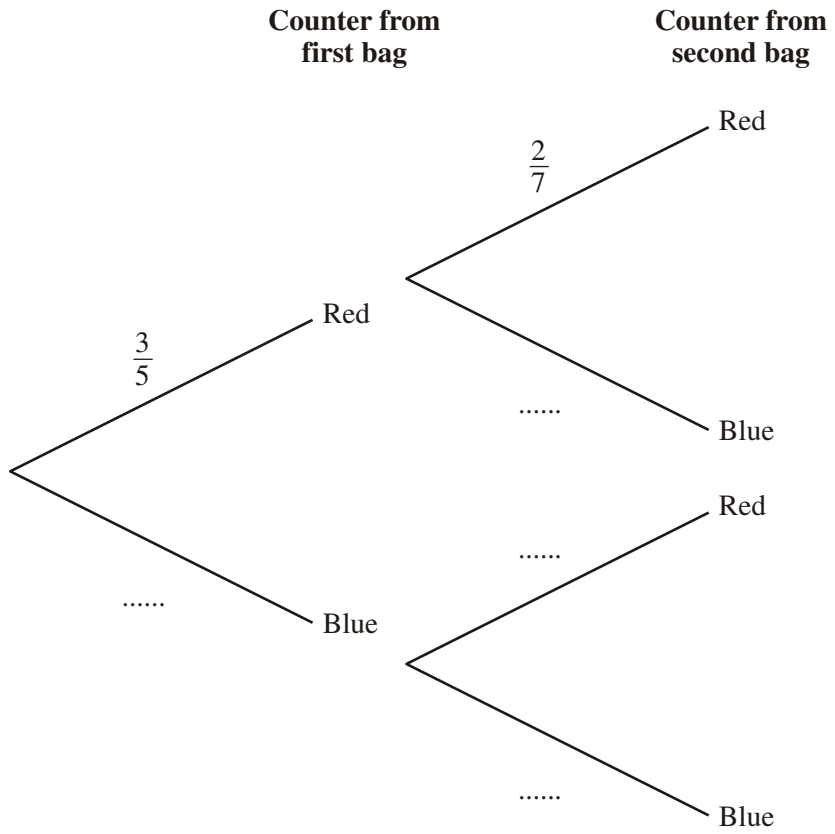
(Total 2 marks)

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16.. Loren has two bags.
The first bag contains 3 red counters and 2 blue counters.
The second bag contains 2 red counters and 5 blue counters.

Loren takes one counter at random from each bag.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Loren takes one counter of each colour.

.....

(3)
(Total 5 marks)

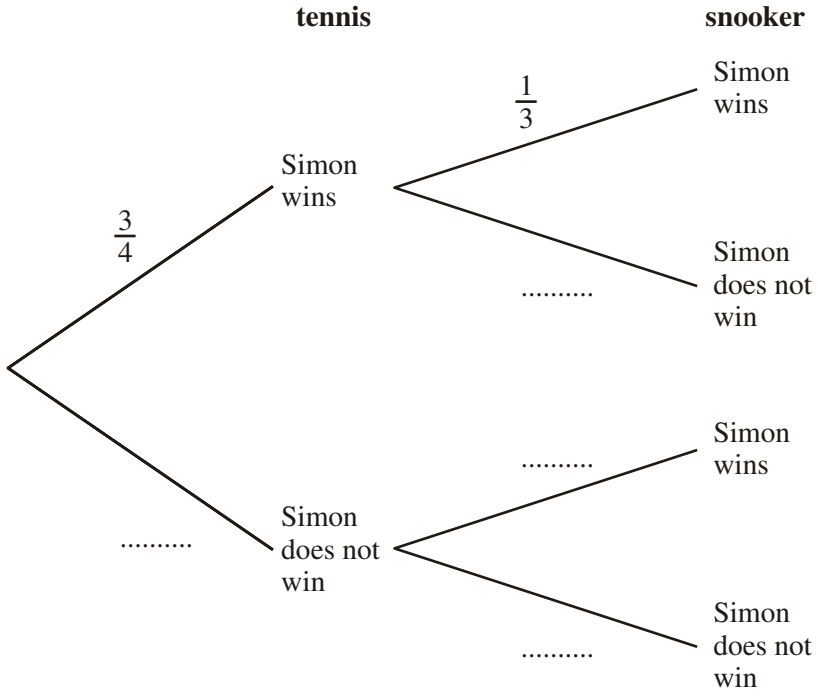
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17. Simon plays one game of tennis and one game of snooker.

The probability that Simon will win at tennis is $\frac{3}{4}$

The probability that Simon will win at snooker is $\frac{1}{3}$

Complete the probability tree diagram.



(Total 2 marks)

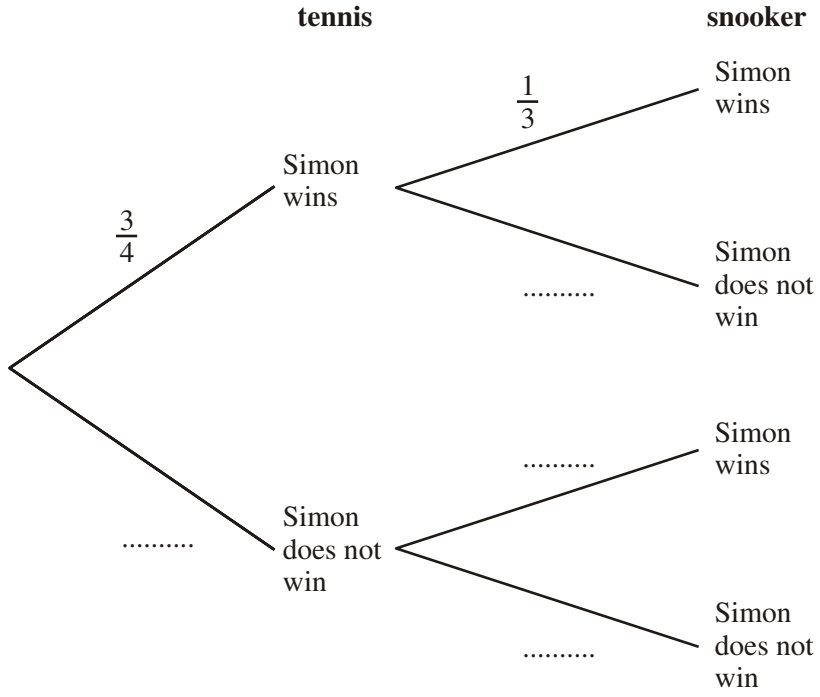
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18. Simon plays one game of tennis and one game of snooker.

The probability that Simon will win at tennis is $\frac{3}{4}$

The probability that Simon will win at snooker is $\frac{1}{3}$

(a) Complete the probability tree diagram below.



(2)

(b) Work out the probability that Simon wins both games.

.....

(2)

(c) Work out the probability that Simon will win only one game.

.....

(3)

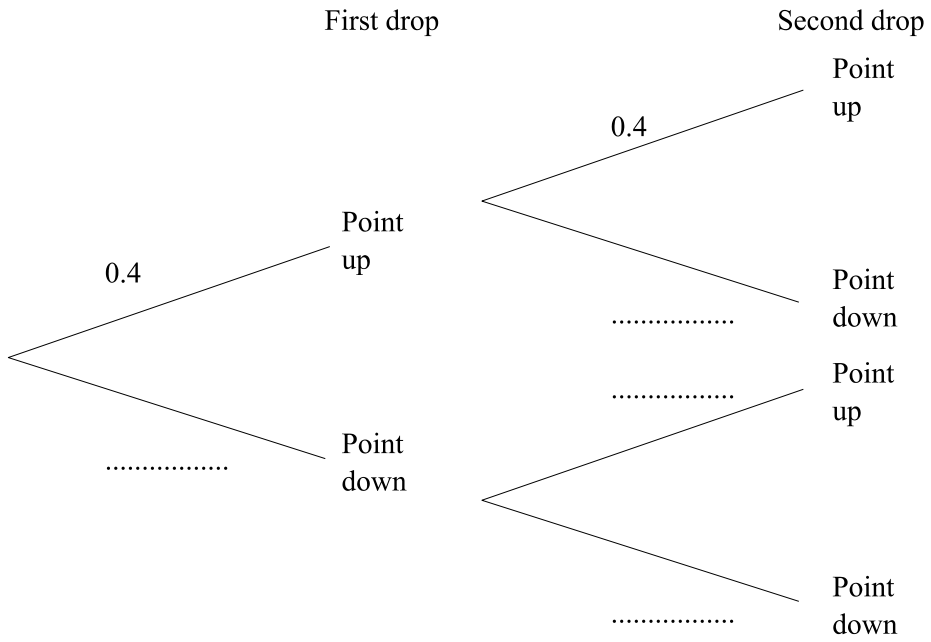
(Total 7 marks)

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19. Mary has a drawing pin.
When the drawing pin is dropped it can land either ‘point up’ or ‘point down’.
The probability of it landing ‘point up’ is 0.4

Mary drops the drawing pin twice.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that the drawing pin will land ‘point up’ both times.

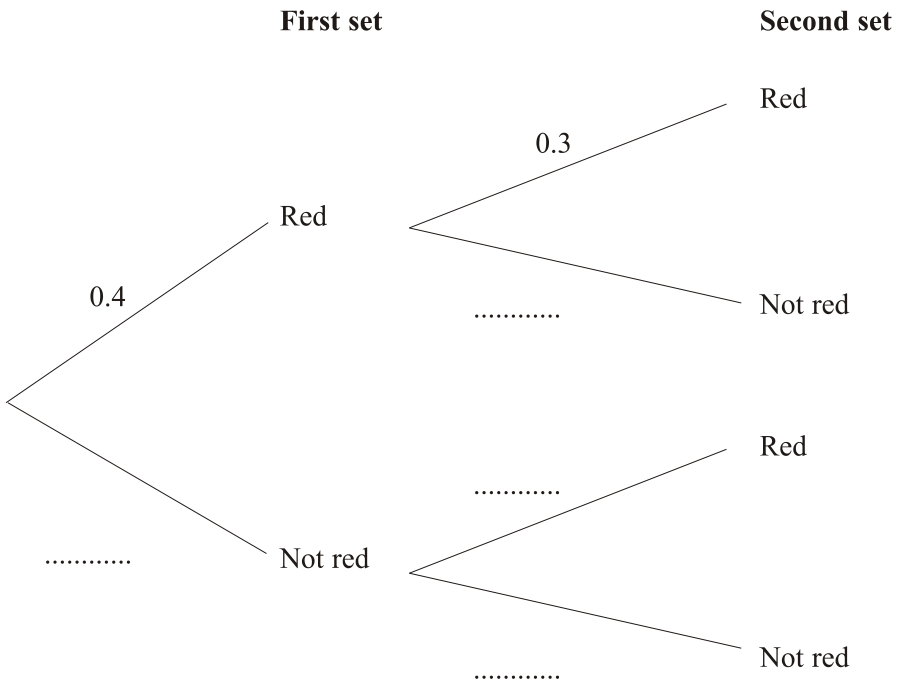
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(2)
(Total 4 marks)

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20. There are two sets of traffic lights on Georgina's route to school.
The probability that the first set of traffic lights will be red is 0.4
The probability that the second set of traffic lights will be red is 0.3

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that both sets of traffic lights will be red.

.....

(2)

(c) Work out the probability that exactly one set of traffic lights will be red.

.....

(3)
(Total 7 marks)

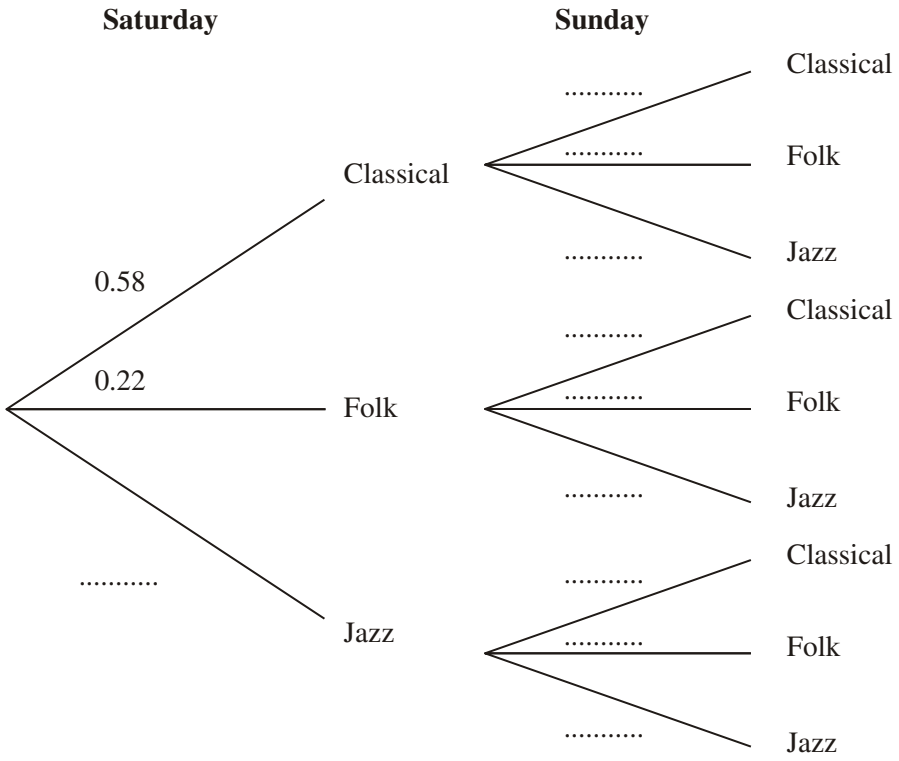
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21. Julie has 100 music CDs.
58 of the CDs are classical.
22 of the CDs are folk.
The rest of the CDs are jazz.

On Saturday, Julie chooses one CD at random from the 100 CDs.
On Sunday, Julie chooses one CD at random from the 100 CDs.

(a) Complete the probability tree diagram.

(2)



(b) Calculate the probability that Julie will choose a jazz CD on **both** Saturday and Sunday.

.....

(2)

(c) Calculate the probability that Julie will choose at least one jazz CD on Saturday and Sunday.

.....

(3)
(Total 7 marks)

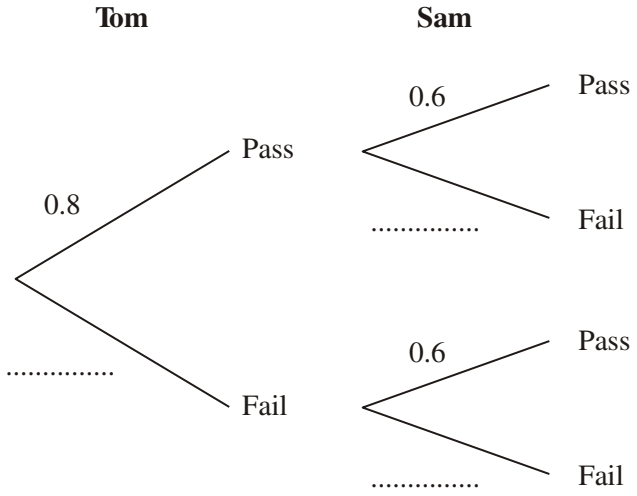
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22. Tom and Sam each take a driving test.

The probability that Tom will pass the driving test is 0.8

The probability that Sam will pass the driving test is 0.6

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that both Tom and Sam will pass the driving test.

.....

(2)

(c) Work out the probability that only one of them will pass the driving test.

.....

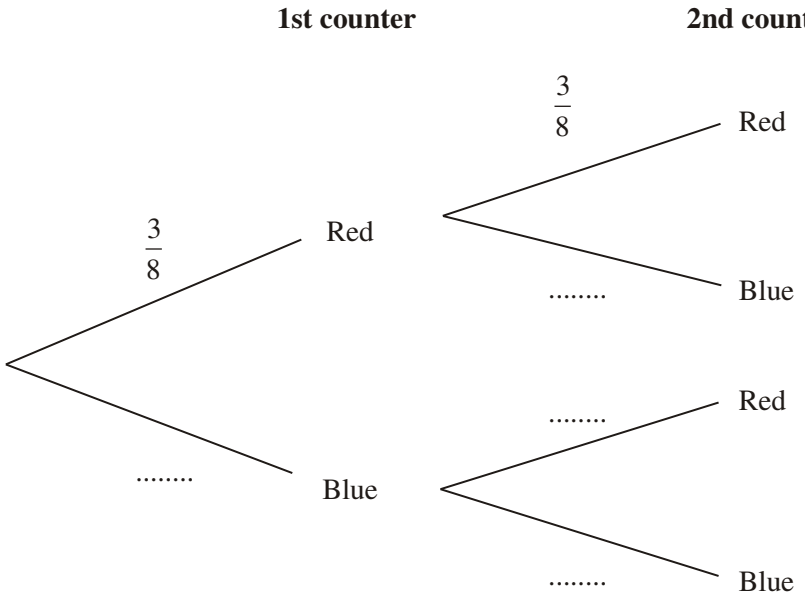
(3)

(Total 7 marks)

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23. Matthew puts 3 red counters and 5 blue counters in a bag.
He takes at random a counter from the bag.
He writes down the colour of the counter.
He puts the counter in the bag again.
He then takes at random a second counter from the bag.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Matthew takes two red counters.

.....

(2)
(Total 4 marks)

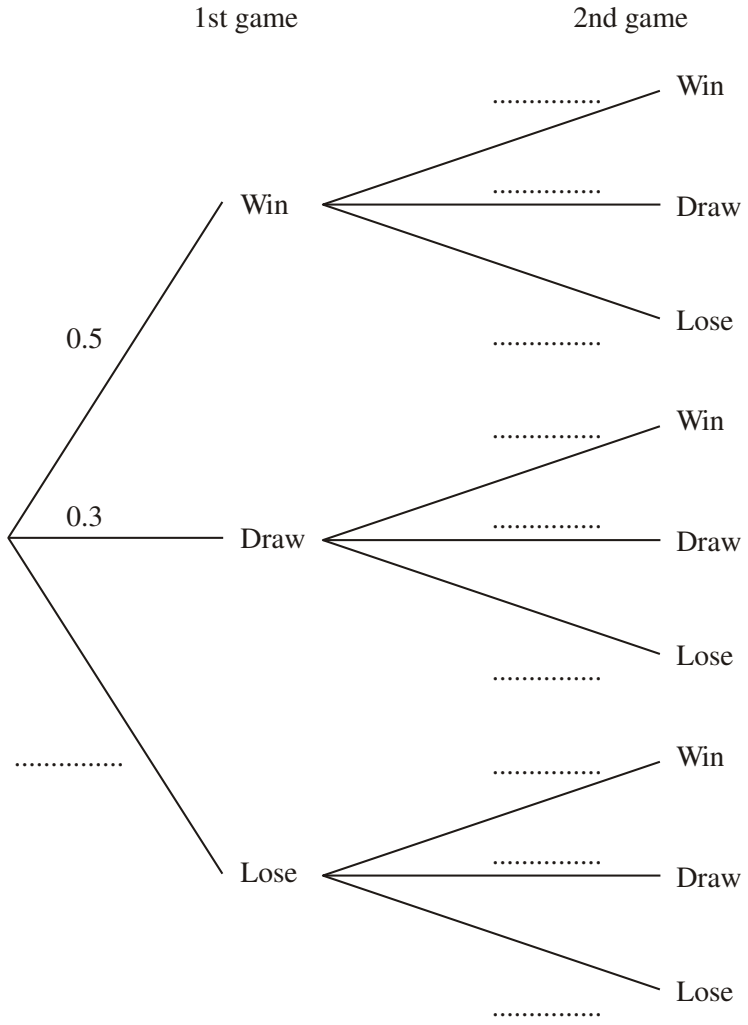
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24. In a game of chess, a player can either win, draw or lose.

The probability that Vishi wins any game of chess is 0.5
The probability that Vishi draws any game of chess is 0.3

Vishi plays 2 games of chess.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Vishi will win both games.

.....

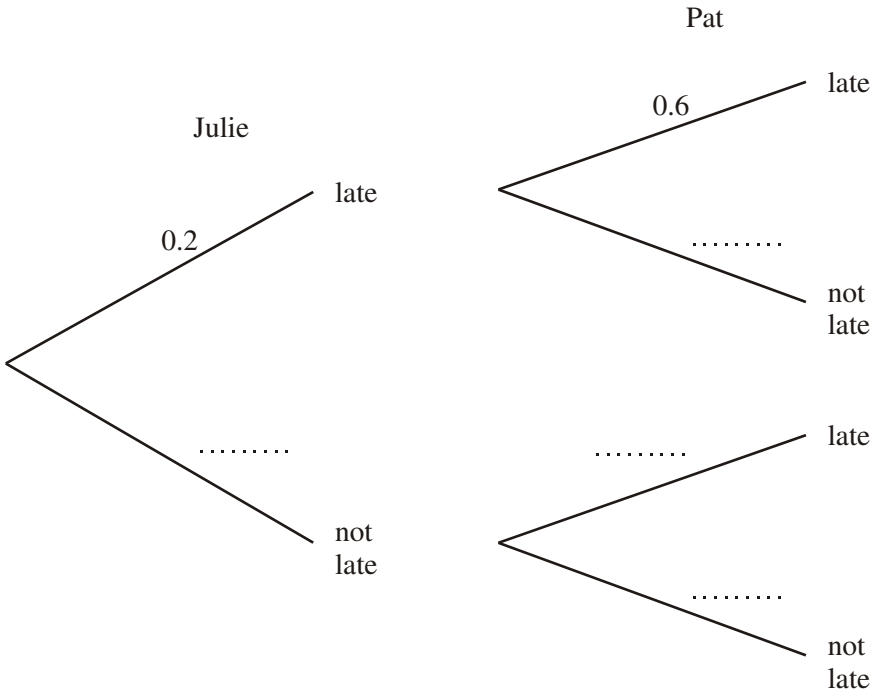
(2)
(Total 4 marks)

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25. Julie and Pat are going to the cinema.

The probability that Julie will arrive late is 0.2
The probability that Pat will arrive late is 0.6
The two events are independent.

(a) Complete the diagram.



(2)

(b) Work out the probability that Julie and Pat will both arrive late.

.....

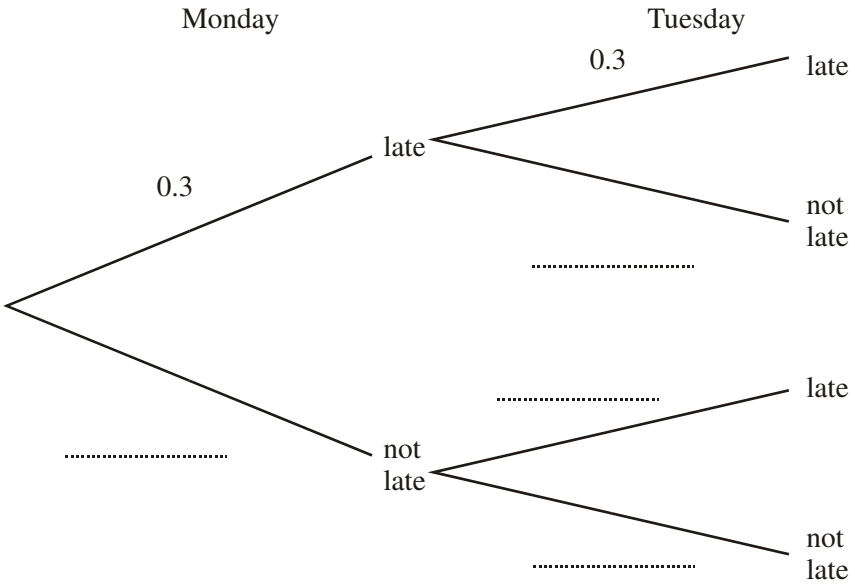
(2)
(Total 4 marks)

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26. Salika travels to school by train every day.

The probability that her train will be late on any day is 0.3

(a) Complete the probability tree diagram for Monday and Tuesday.



(2)

(b) Work out the probability that her train will be late on **at least one** of these two days.

……

(3)

(Total 5 marks)

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27. Jacob has 2 bags of sweets.



Bag **P**

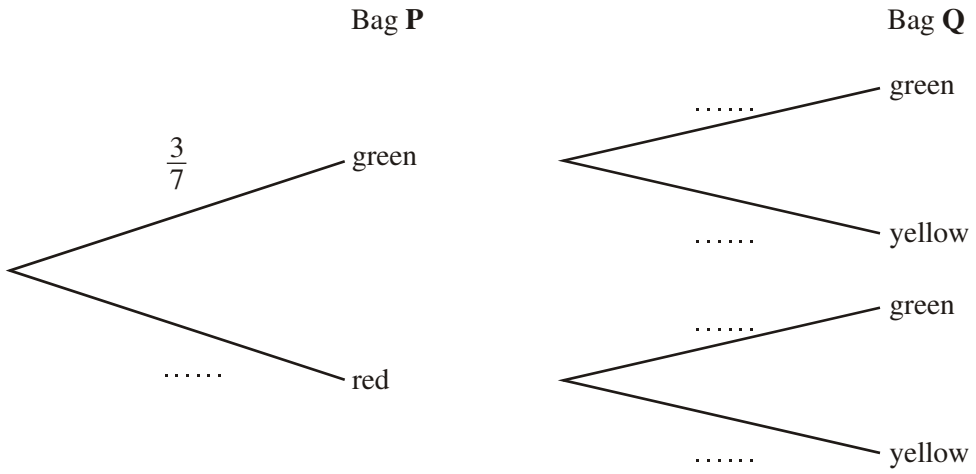


Bag **Q**

Bag **P** contains 3 green sweets and 4 red sweets.
Bag **Q** contains 1 green sweet and 3 yellow sweets.

Jacob takes one sweet at random from each bag.

(a) Complete the tree diagram.



(2)

(b) Calculate the probability that Jacob will take 2 green sweets.

.....

(2)
(Total 4 marks)

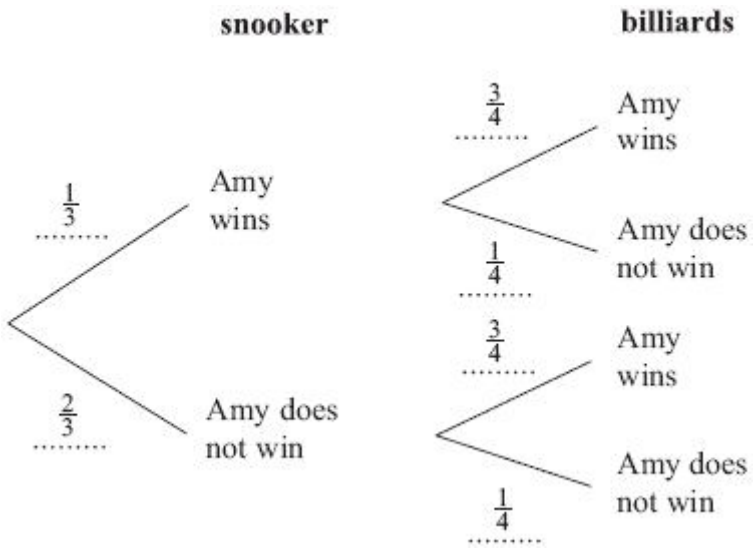
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28. Amy is going to play one game of snooker and one game of billiards.

The probability that she will win the game of snooker is $\frac{1}{3}$

The probability that she will win the game of billiards is $\frac{3}{4}$

The probability tree diagram shows this information.



Amy played one game of snooker and one game of billiards on a number of Fridays.
She won at **both** snooker and billiards on 21 Fridays.

Work out an estimate for the number of Fridays on which Amy did not win either game.

.....

(Total 3 marks)

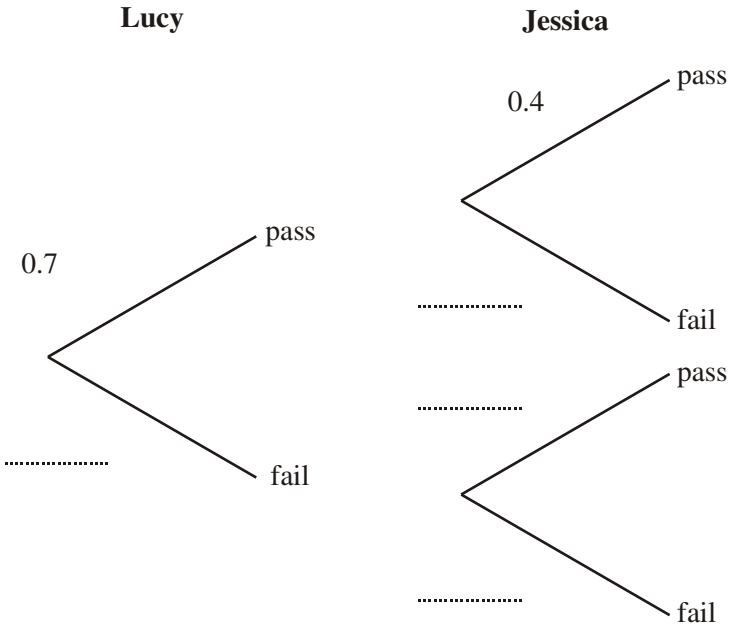
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29. Lucy and Jessica take a test.

The probability that Lucy will pass the test is 0.7

The probability that Jessica will pass the test is 0.4

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that only one of the 2 girls will pass the test.

.....

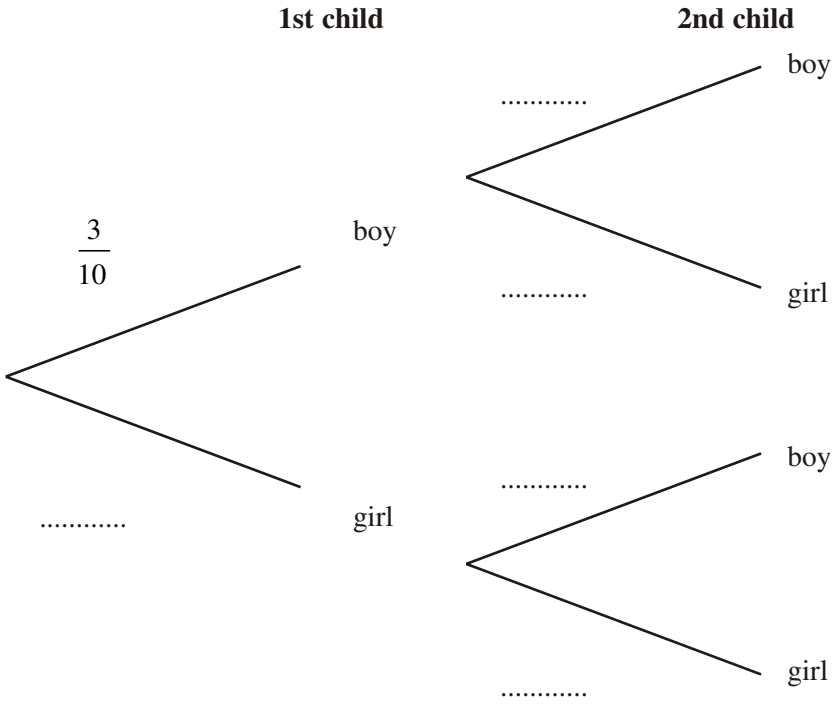
(3)

(Total 5 marks)

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30. There are 3 boys and 7 girls at a playgroup.
Mrs Gold selects two children at random.

(a) Complete the probability tree diagram below.



(2)

(b) Work out the probability that Mrs Gold selects two girls.

.....

(2)
(Total 4 marks)

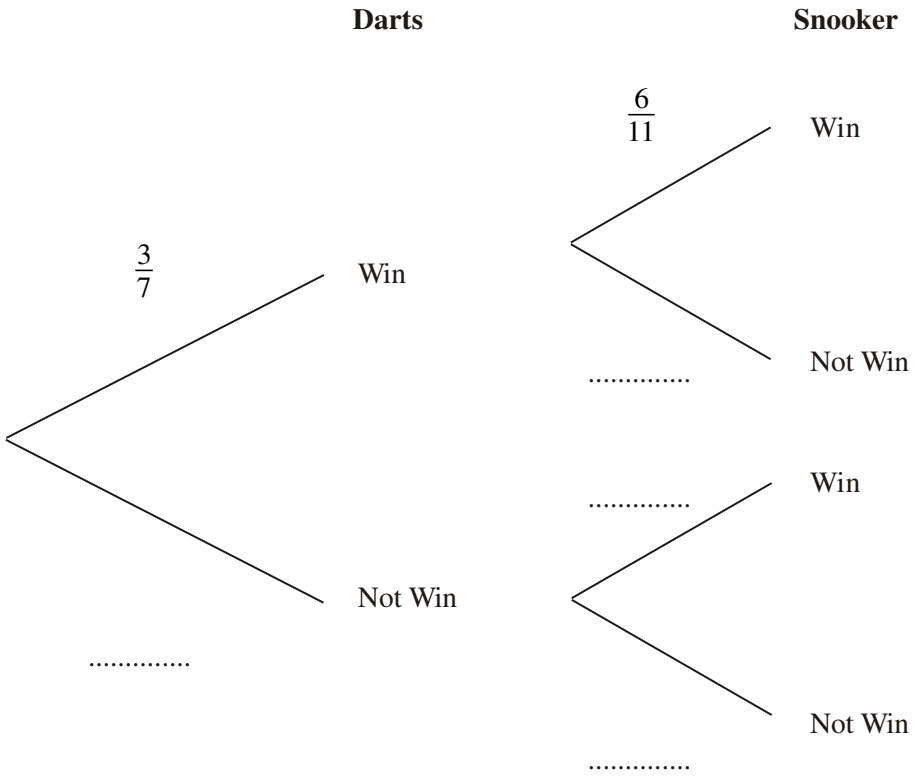
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31. Ivan plays a game of darts and a game of snooker.

The probability that he will win at darts is $\frac{3}{7}$

The probability that he will win at snooker is $\frac{6}{11}$

Complete the probability tree diagram.



(Total 2 marks)

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32. There are 3 strawberry yoghurts, 2 peach yoghurts and 4 cherry yoghurts in a fridge.

Kate takes a yoghurt at random from the fridge.
She eats the yoghurt.
She then takes a second yoghurt at random from the fridge.

Work out the probability that both the yoghurts were the same flavour.

.....

(Total 4 marks)

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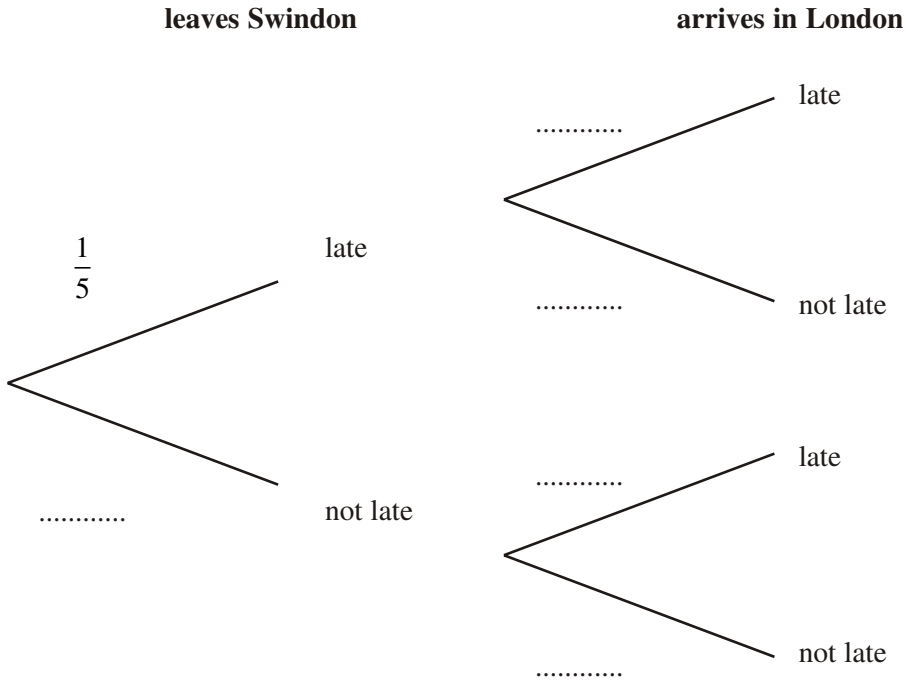
33. Nicola is going to travel from Swindon to London by train.

The probability that the train will be late leaving Swindon is $\frac{1}{5}$

If the train is late leaving Swindon, the probability that it will arrive late in London is $\frac{7}{10}$

If the train is **not** late leaving Swindon, the probability that it will arrive late in London is $\frac{1}{10}$

(a) Complete the probability tree diagram.



(2)

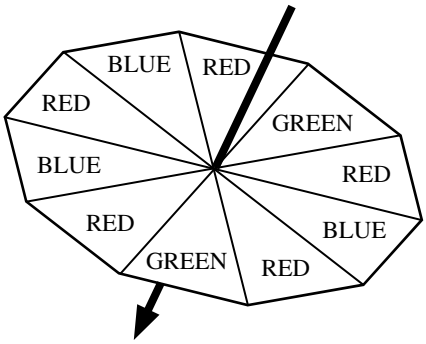
(b) Work out the probability that Nicola will arrive late in London.

.....

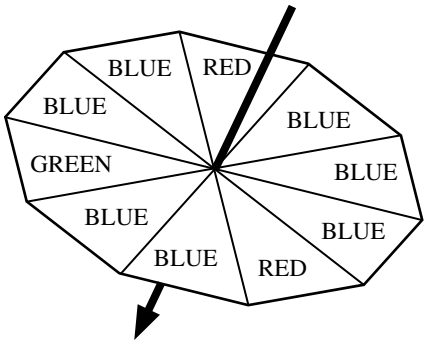
(3)
(Total 5 marks)

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34. William has two 10-sided spinners.
The spinners are equally likely to land on each of their sides.



A



B

Spinner **A** has 5 red sides, 3 blue sides and 2 green sides.
Spinner **B** has 2 red sides, 7 blue sides and 1 green side.

William spins spinner **A** once.
He then spins spinner **B** once.

Work out the probability that spinner **A** and spinner **B** do **not** land on the same colour.

.....

(Total 4 marks)

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35. There are 4 bottles of orange juice,
3 bottles of apple juice,
2 bottles of tomato juice.

Viv takes a bottle at random and drinks the juice.
Then Caroline takes a bottle at random and drinks the juice.

Work out the probability that they both take a bottle of the same type of juice.

.....

(Total 4 marks)

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