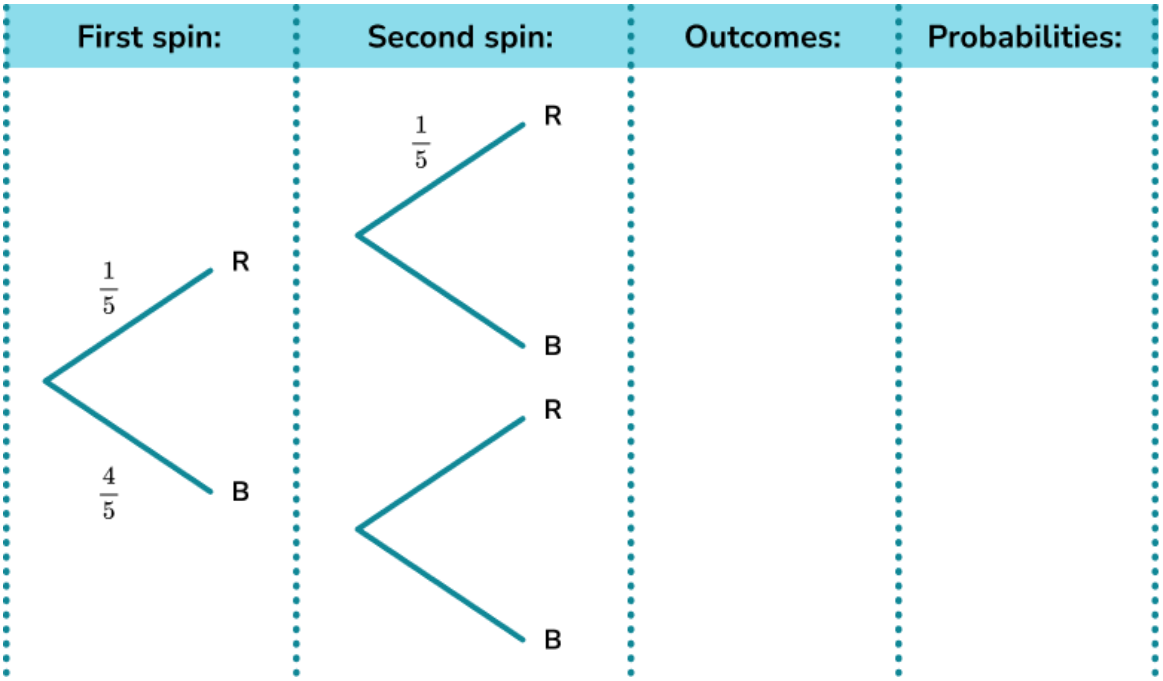
Probability tree diagrams - Worksheet

Skill

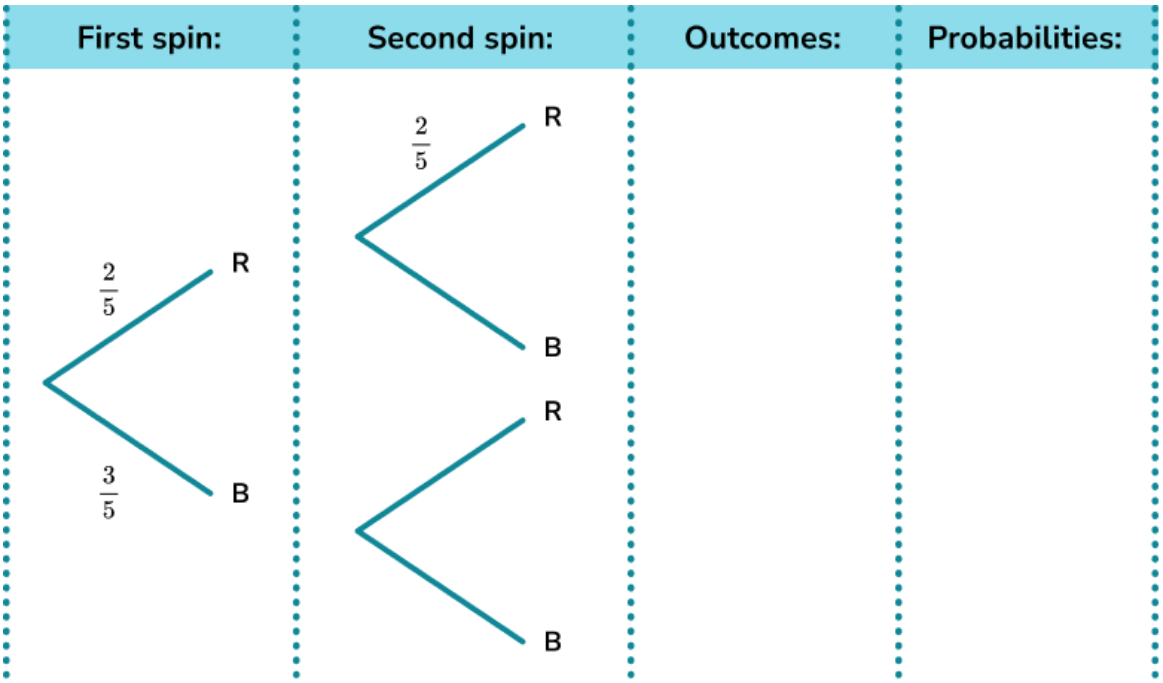
Group A - Repeated event

Complete the probability tree diagrams, including the outcomes and their probabilities:

1) A spinner has 5 sections, 1 red and 4 blue. The spinner is spun twice.

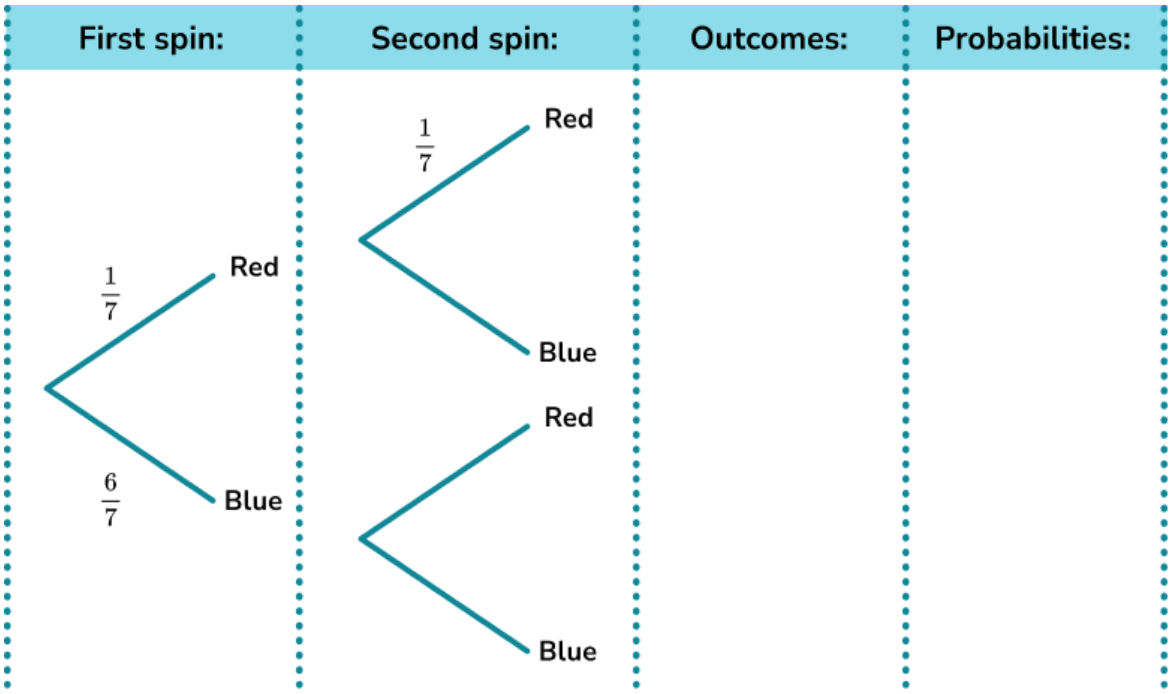


2) A spinner has 5 sections, 2 red and 3 blue. The spinner is spun twice.

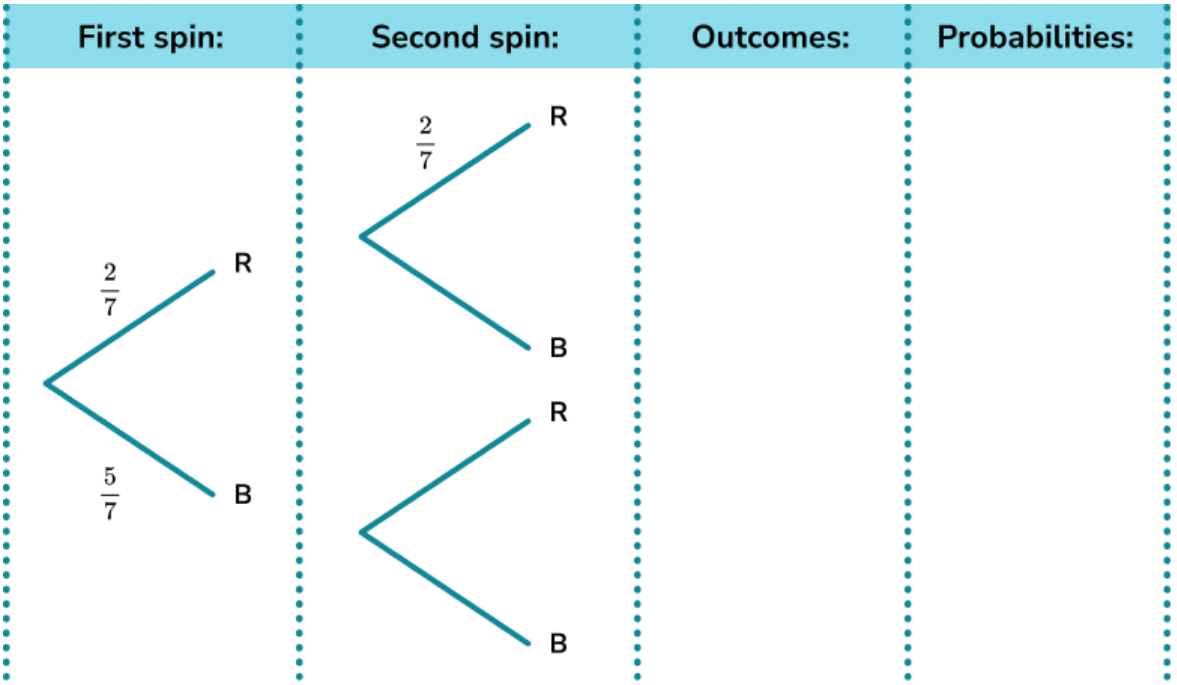


Probability tree diagrams - Worksheet

3) A spinner has 7 sections, 1 red and 6 blue. The spinner is spun twice.



4) A spinner has 7 sections, 2 red and 5 blue. The spinner is spun twice.

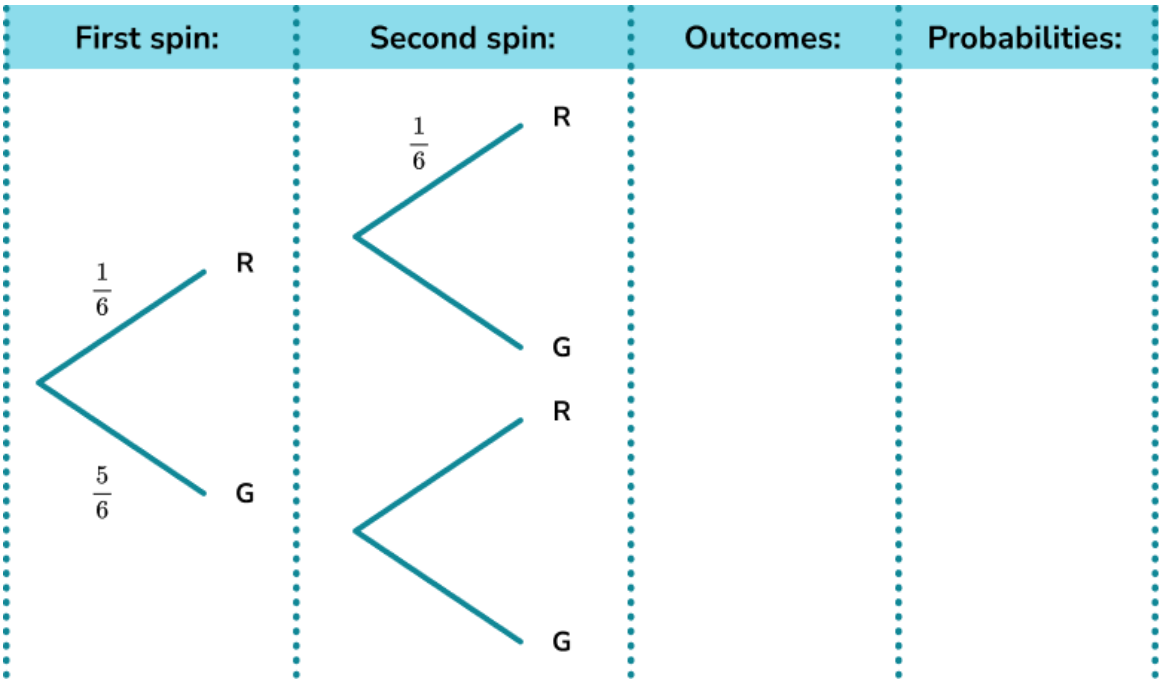


Probability tree diagrams - Worksheet

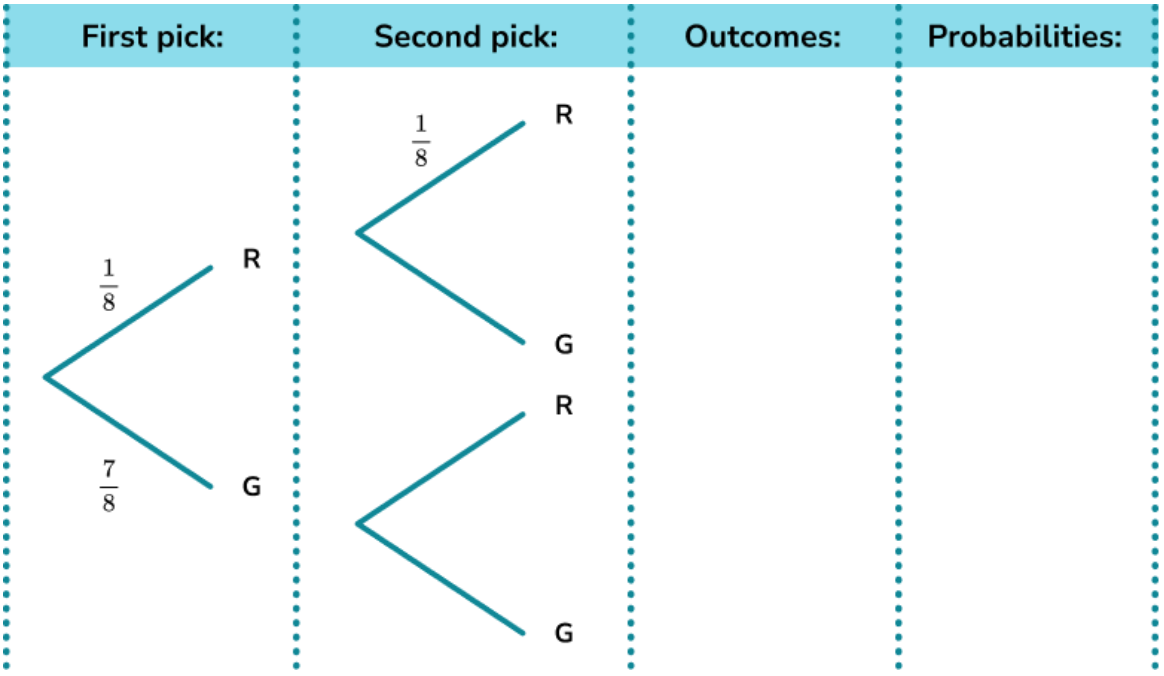
Group B - With replacement

Complete the probability tree diagrams, including the outcomes and their probabilities:

1) A bag has 6 balls, 1 red and 5 green. A ball is picked and replaced. A second ball is picked.

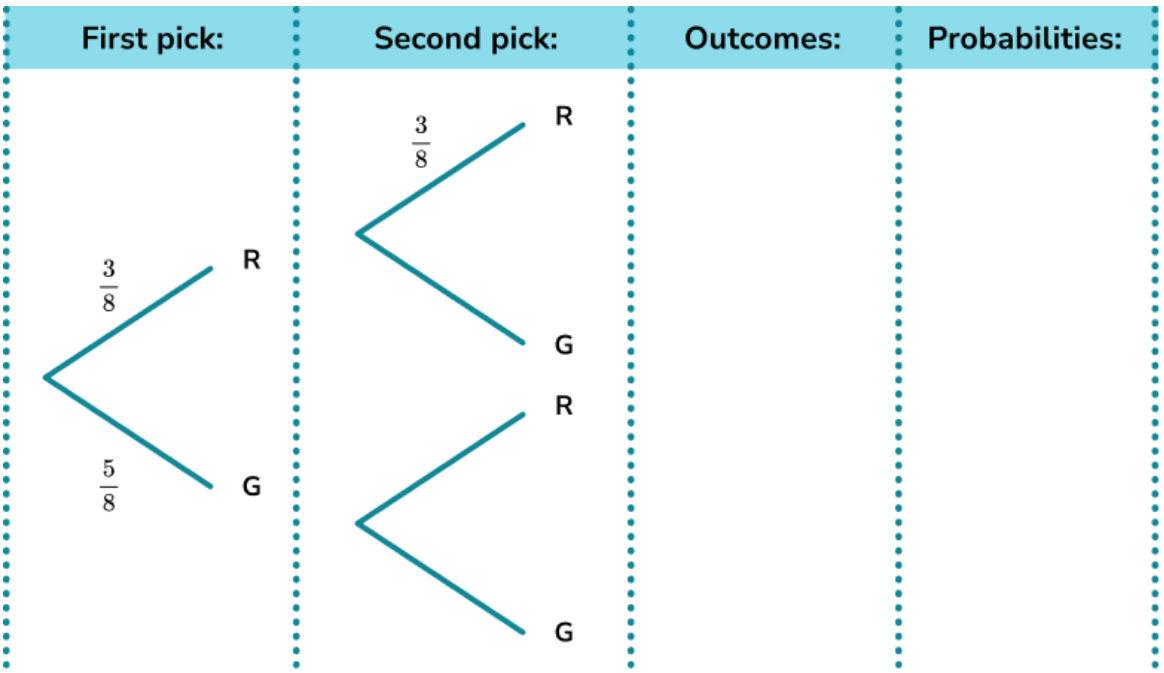


2) A bag has 8 balls, 1 red and 7 green. A ball is picked and replaced. A second ball is picked.

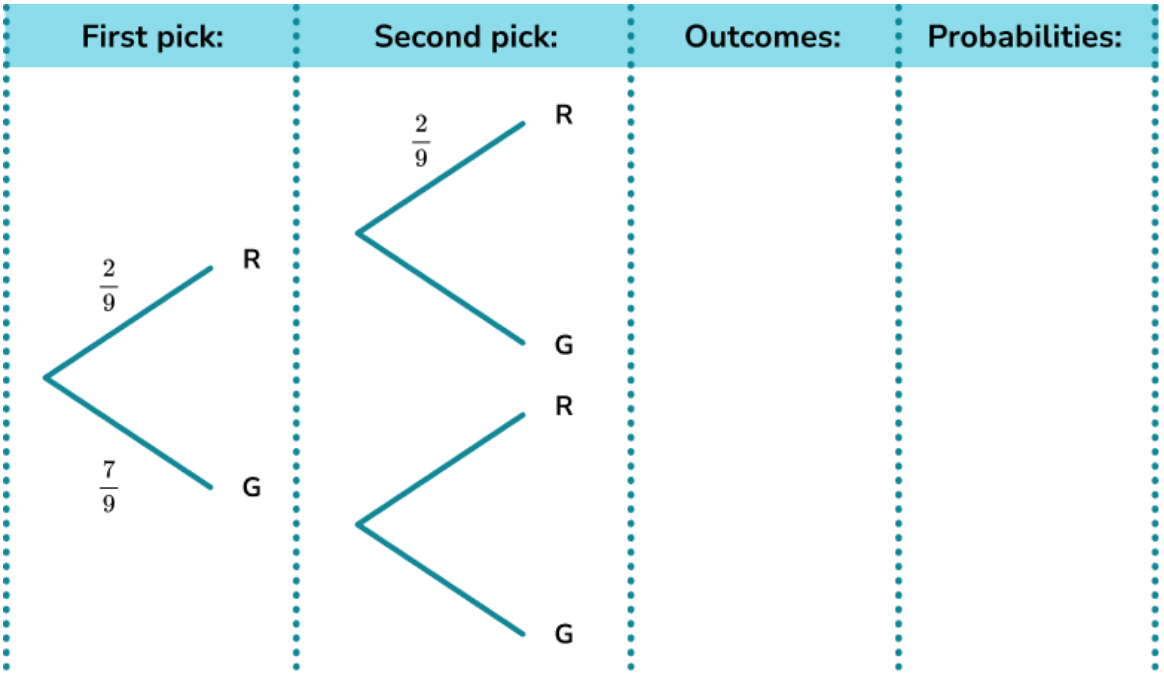


Probability tree diagrams - Worksheet

3) A bag has 8 balls, 3 red and 5 green. A ball is picked and replaced. A second ball is picked.



4) A bag has 9 balls, 2 red and 7 green. A ball is picked and replaced. A second ball is picked.

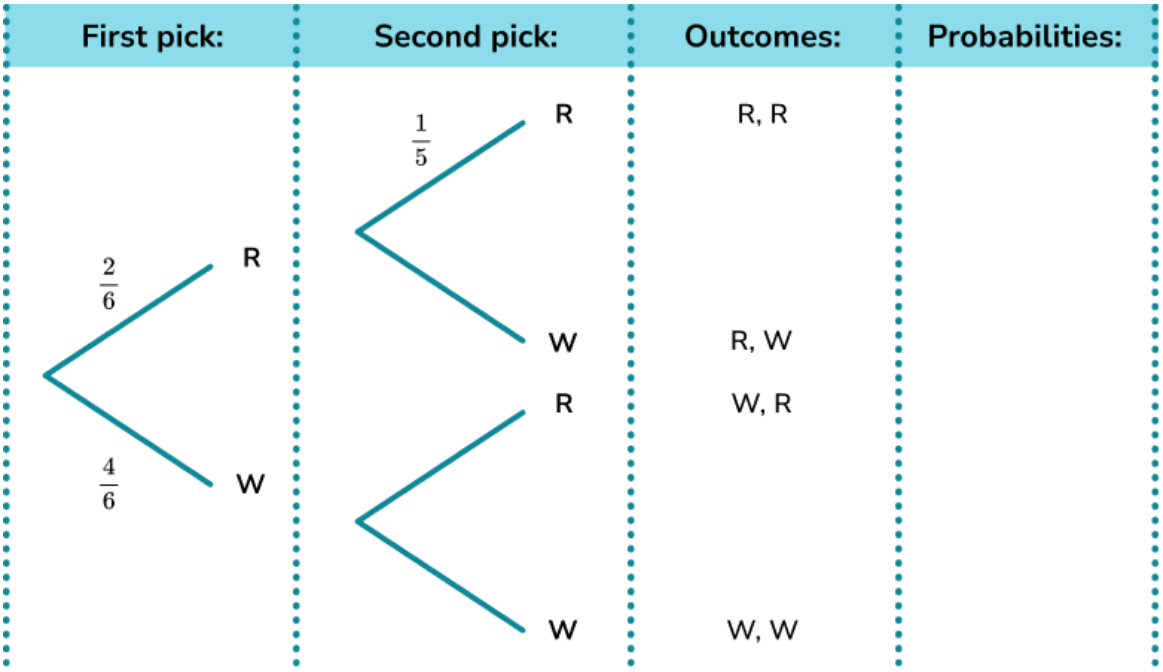


Probability tree diagrams - Worksheet

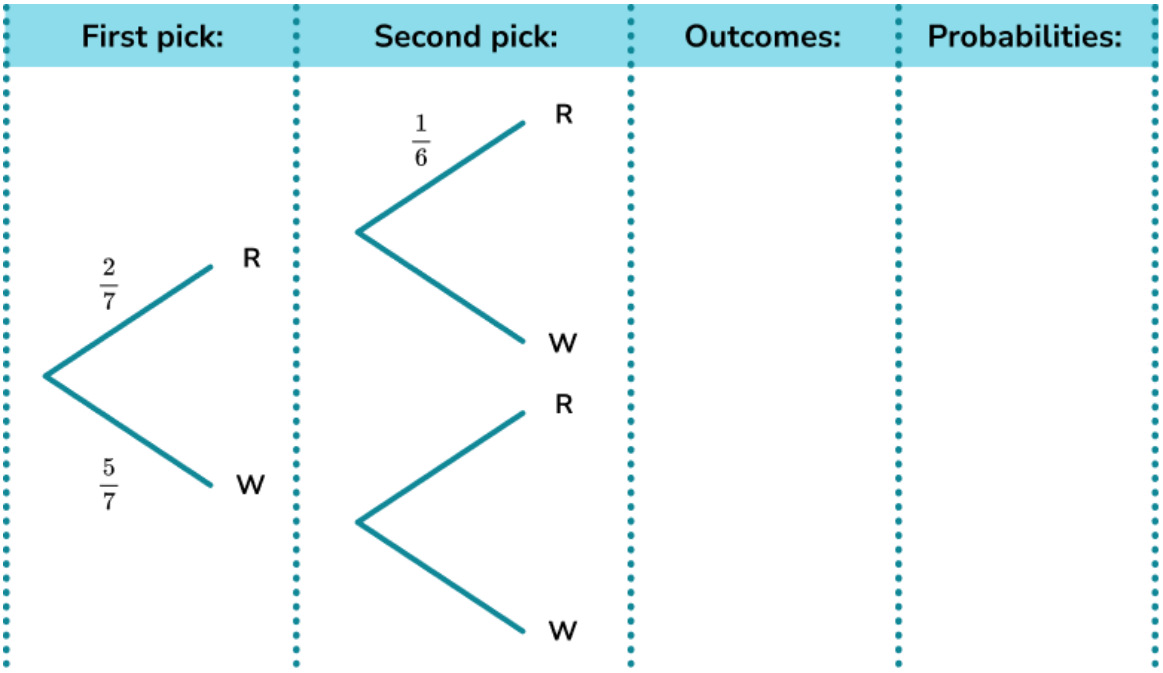
Group C - Without replacement

Complete the probability tree diagrams, including the outcomes and their probabilities: (There is no need to simplify the fractions).

1) A bag has 6 balls, 2 red and 4 white. A ball is picked and **not** replaced. A second ball is picked.

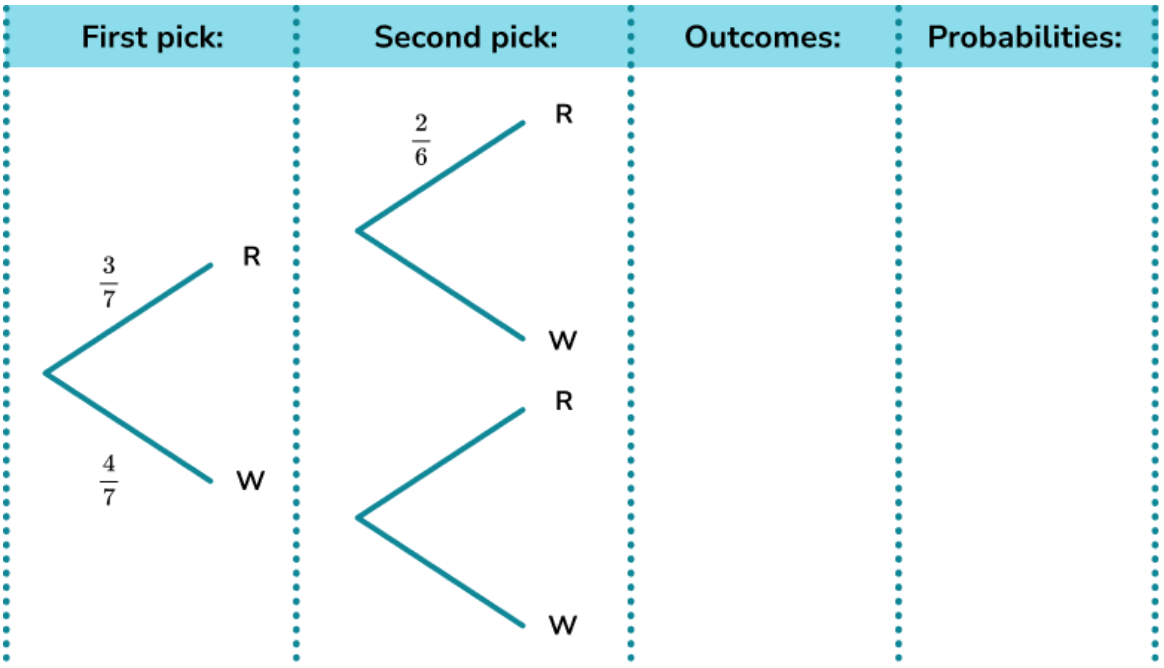


2) A bag has 7 balls, 2 red and 5 white. A ball is picked and **not** replaced. A second ball is picked.

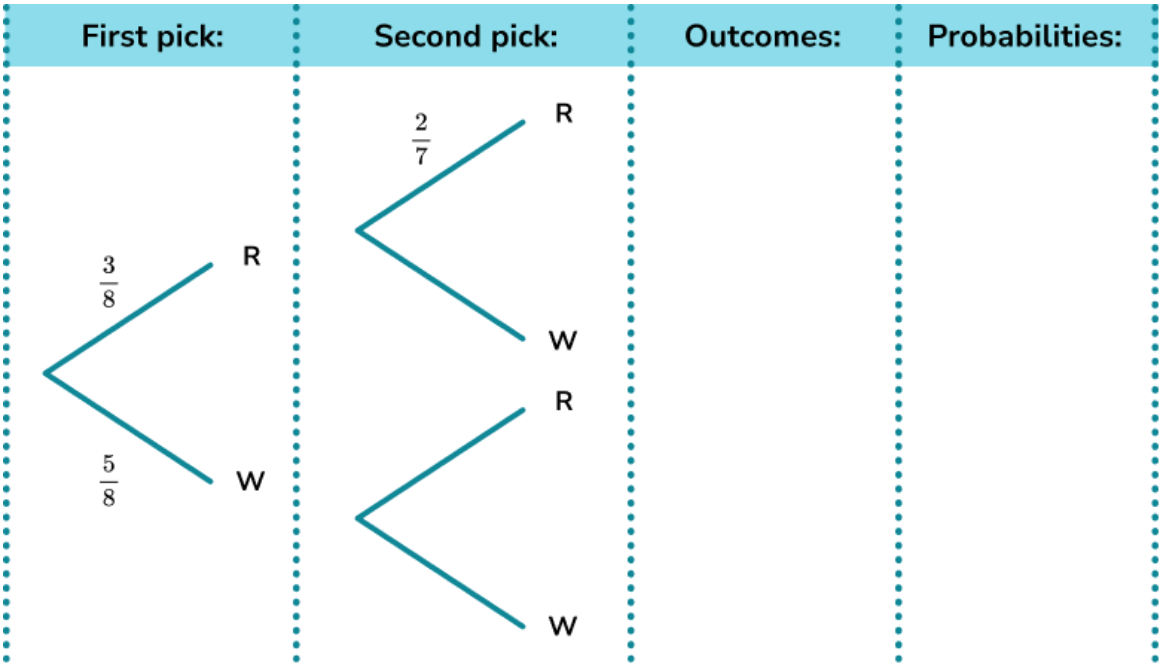


Probability tree diagrams - Worksheet

3) A bag has 7 balls, 3 red and 4 white. A ball is picked and **not** replaced. A second ball is picked.



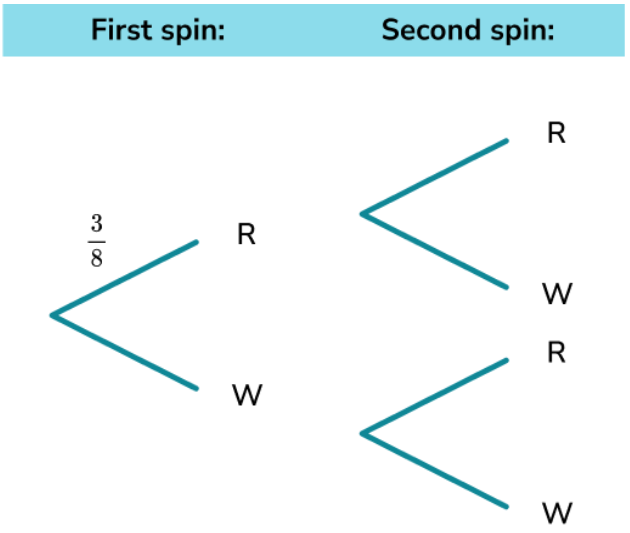
4) A bag has 8 balls, 3 red and 5 white. A ball is picked and **not** replaced. A second ball is picked.



Probability tree diagrams - Worksheet

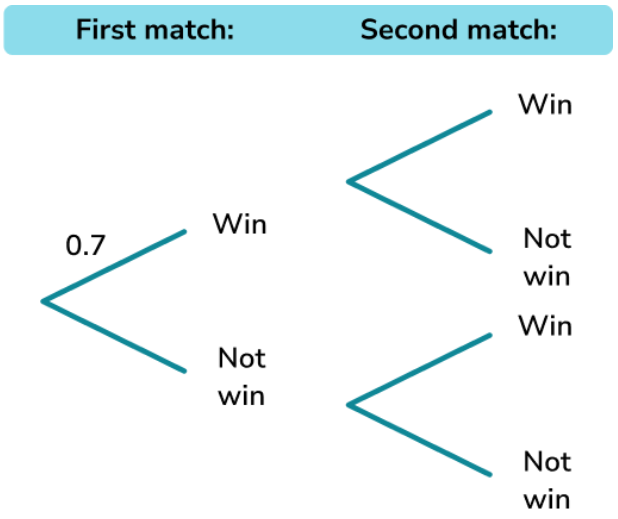
Applied

1) **(a)** A spinner has 8 sections. 3 sections are red and the remaining sections are white. The spinner is spun twice. Fill in the missing probabilities on the tree diagram.



(b) Work out the probability that the spinner lands on red twice.

2) **(a)** Maria plays tennis. The probability that she wins a match is 0. 7. Maria plays 2 matches. Fill in the missing probabilities on the tree diagram.

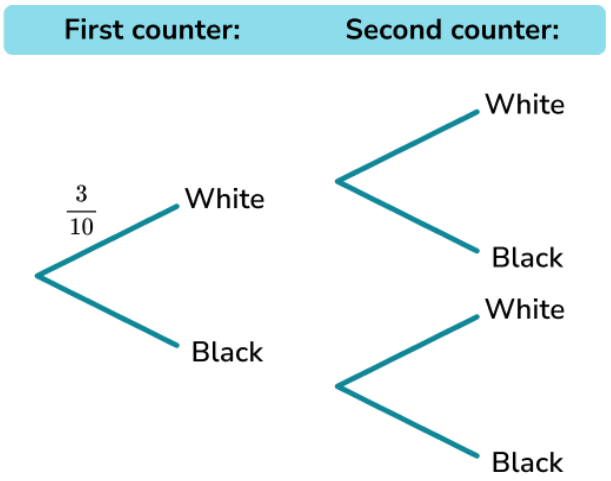


(b) Work out the probability that Maria wins at least one match.

Probability tree diagrams - Worksheet

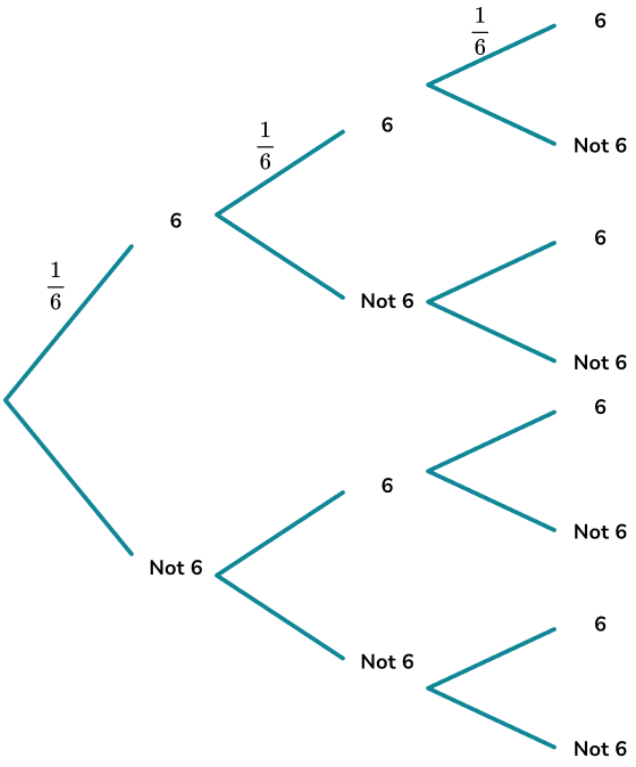
3) **(a)** 10 counters are in a bag. There are 3 white counters and the remaining counters are black. A counter is picked out at random. It is **not** replaced. A second counter is picked out at random.

Fill in the missing probabilities on the tree diagram.



(b) Work out the probability that one of each colour counter is picked.

4) **(a)** Three unbiased dice are rolled.
Fill in the missing probabilities.

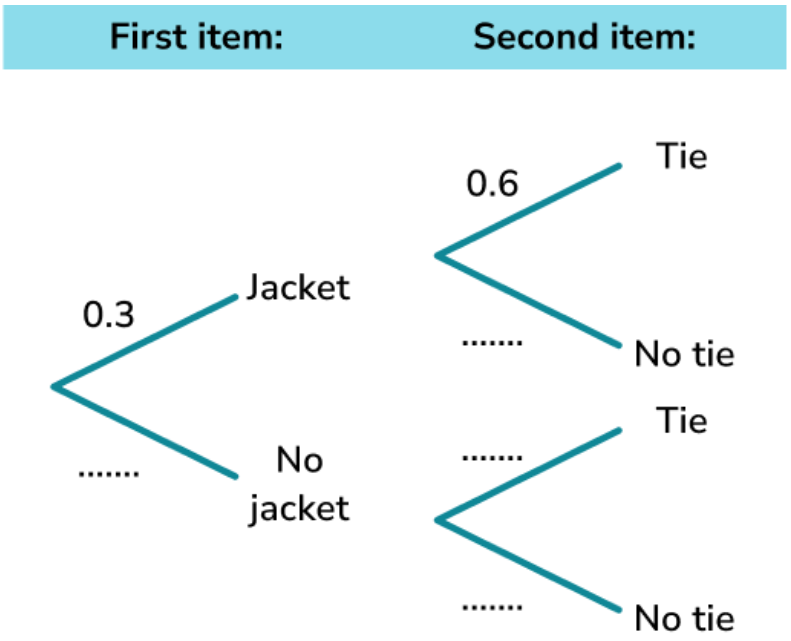


(b) Work out the probability that only one '6' is rolled.

Probability tree diagrams - Exam Questions

1) **(a)** Mr Jamal gets ready in the morning. The probability he wears a jacket is 0.3. The probability that he wears a tie is 0.6.

Complete the tree diagram.



(2)

(b) Work out the probability that Mr Jamal wears a jacket and a tie.

.....

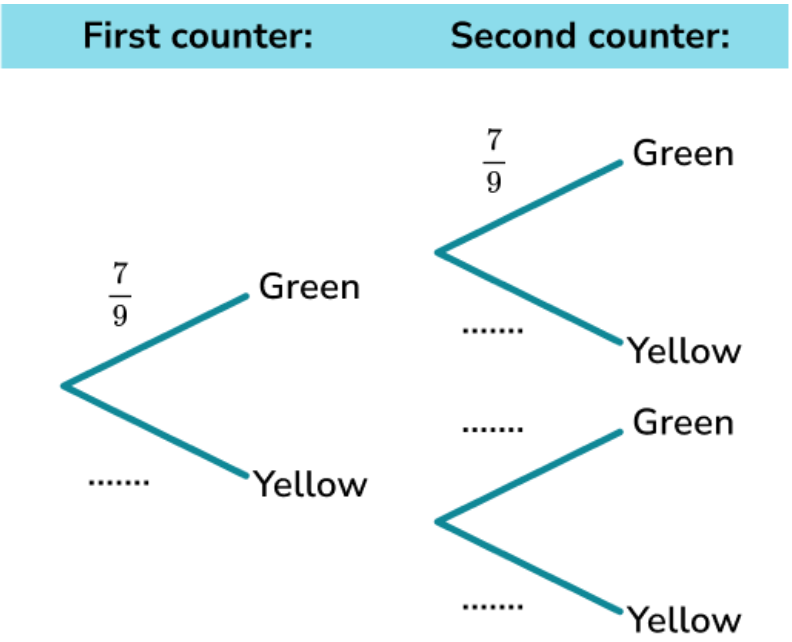
(2)

(4 marks)

Probability tree diagrams - Exam Questions

2) **(a)** A bag contains only green and yellow counters. Sophie picks a counter at random and then replaces it. Sophie then picks a second counter.

Complete the tree diagram.



(2)

(b) Work out the probability that Sophie picks 2 green counters.

.....

(2)

(c) Work out the probability that Sophie picks at least one green counter.

.....

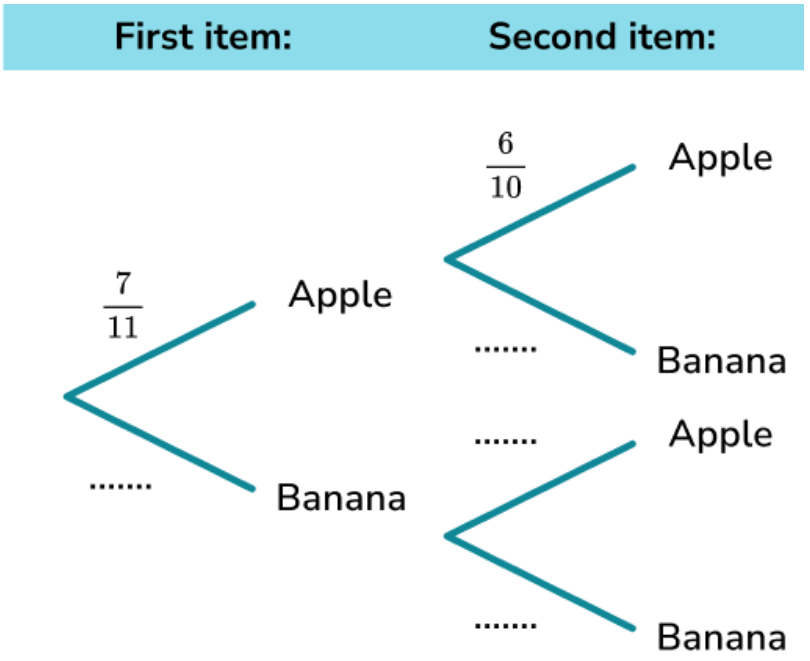
(2)

(6 marks)

Probability tree diagrams - Exam Questions

3) **(a)** There are 7 apples and 4 bananas in a fruit bowl. A piece of fruit is selected at random. It is eaten. A second piece of fruit is selected at random and is also eaten.

Complete the tree diagram.



(2)

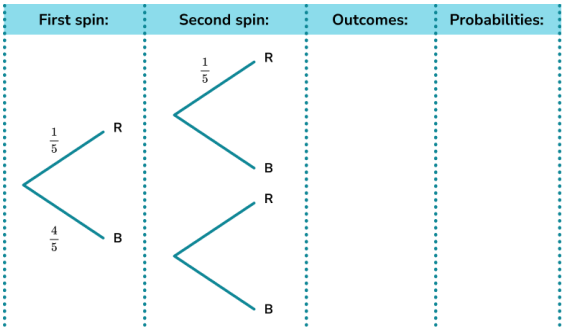
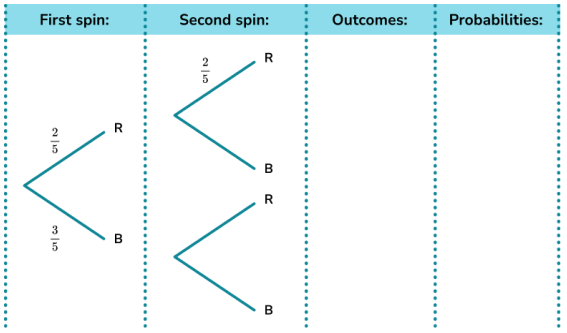
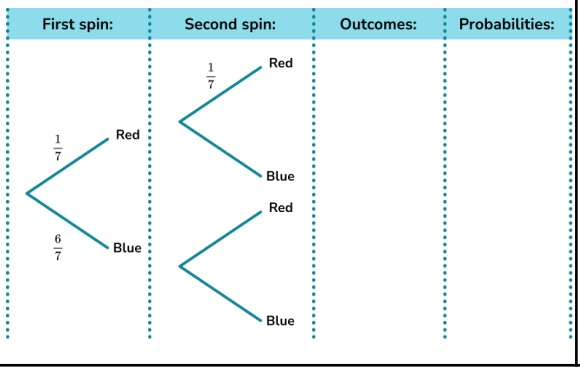
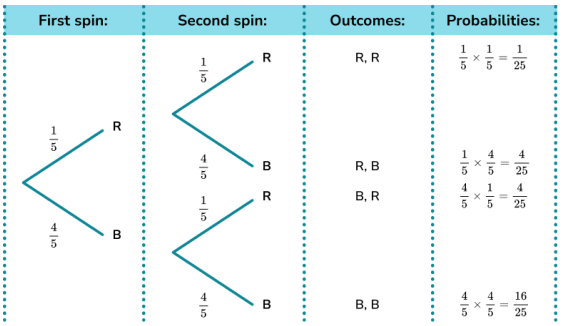
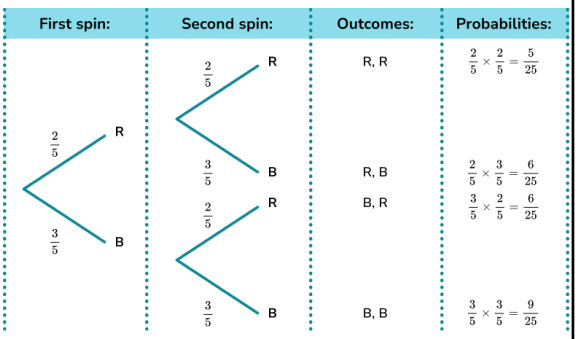
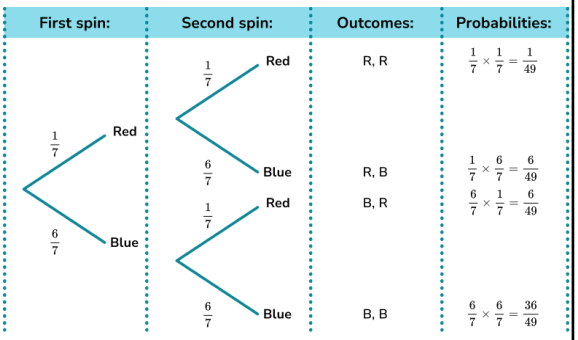
(b) Work out the probability that one of each type of fruit is eaten.

.....

(3)

(5 marks)

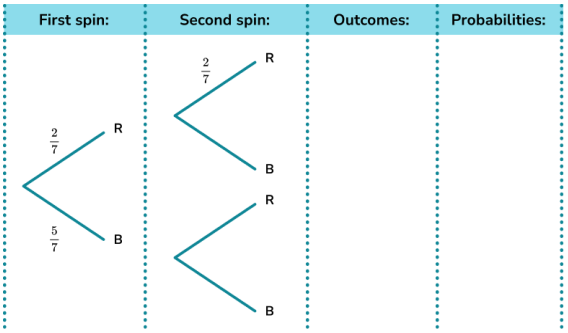
Probability tree diagrams - Answers

	Question	Answer
	Skill Questions	
Group A	Complete the probability tree diagrams, including the outcomes and their probabilities: **1)** A spinner has 5 sections, 1 red and 4 blue. The spinner is spun twice.  **2)** A spinner has 5 sections, 2 red and 3 blue. The spinner is spun twice.  **3)** A spinner has 7 sections, 1 red and 6 blue. The spinner is spun twice.  	**1)**  **2)**  **3)** 

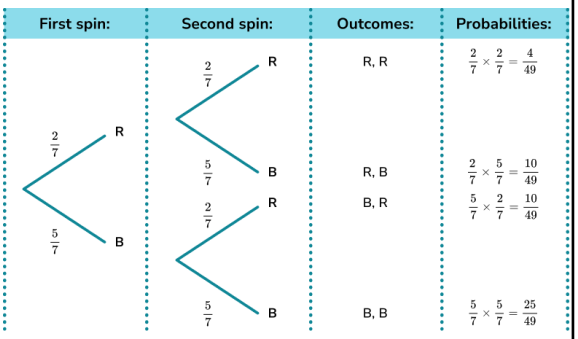
Probability tree diagrams - Answers

Group A contd

4) A spinner has 7 sections, 2 red and 5 blue. The spinner is spun twice.



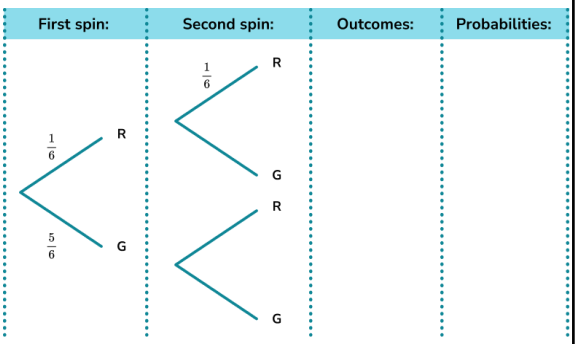
4)



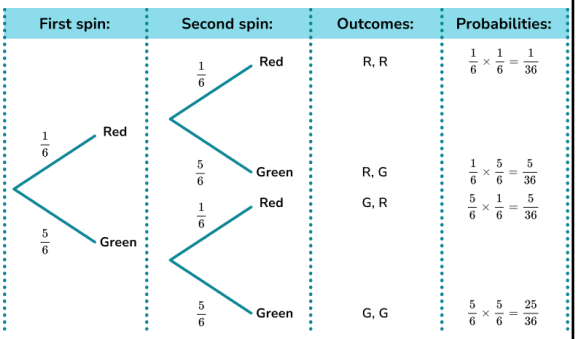
Group B

Complete the probability tree diagrams, including the outcomes and their probabilities:

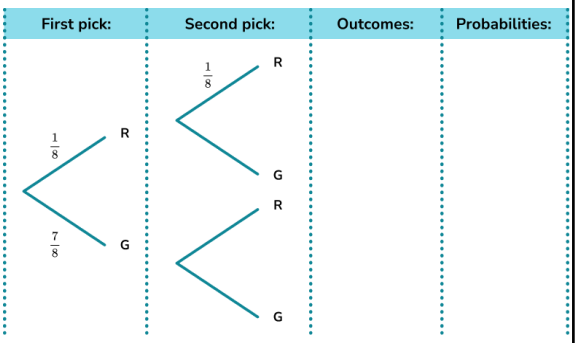
1) A bag has 6 balls, 1 red and 5 green. A ball is picked and replaced. A second ball is picked



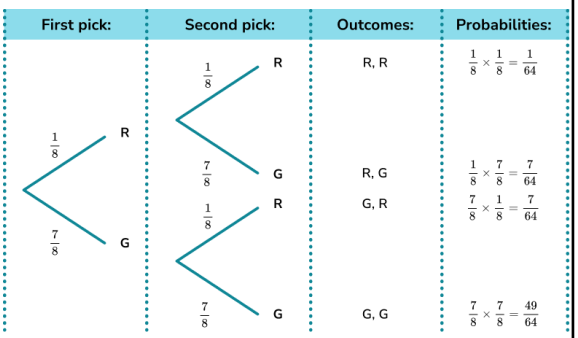
1)



2) A bag has 8 balls, 1 red and 7 green. A ball is picked and replaced. A second ball is picked



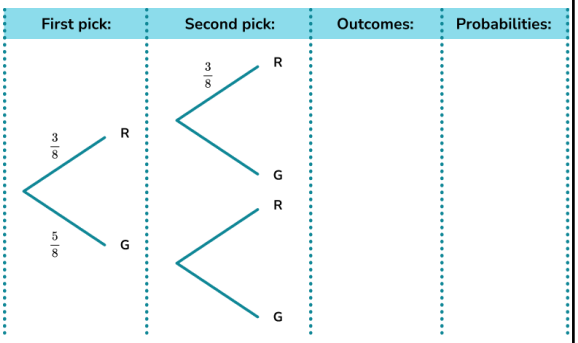
2)



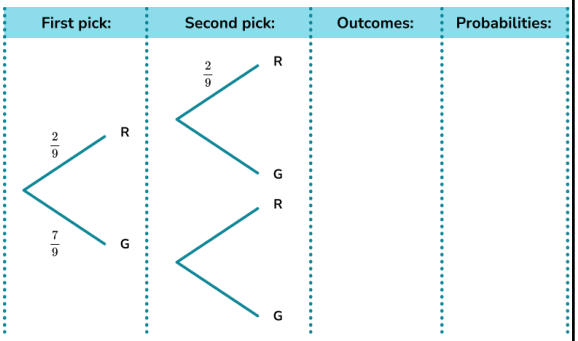
Probability tree diagrams - Answers

Group B contd

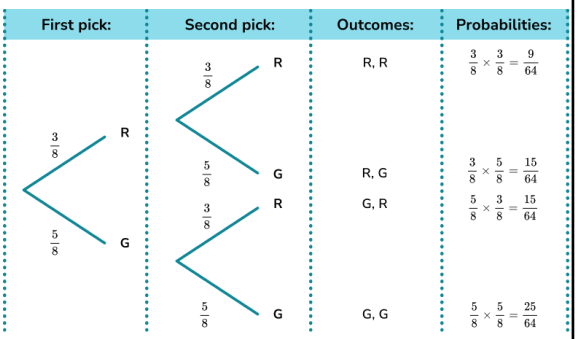
3) A bag has 8 balls, 3 red and 5 green. A ball is picked and replaced. A second ball is picked.



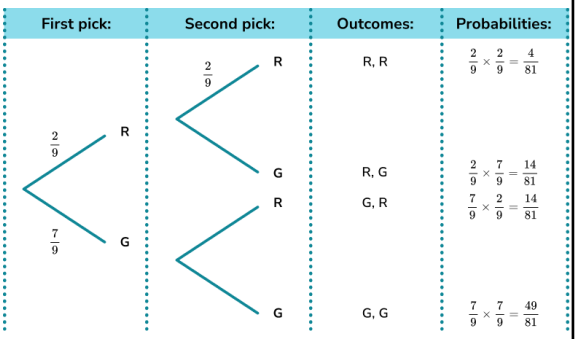
4) A bag has 9 balls, 2 red and 7 green. A ball is picked and replaced. A second ball is picked.



3)



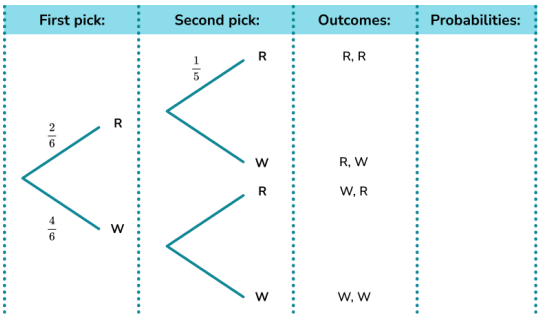
4)



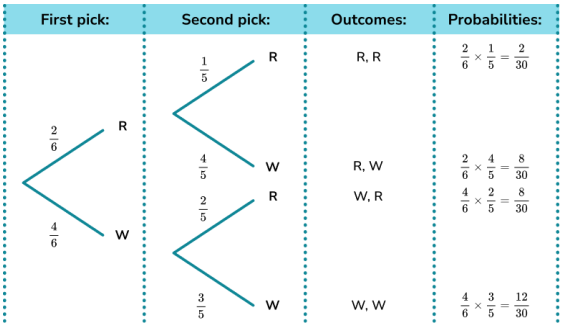
Group C

Complete the probability tree diagrams, including the outcomes and their probabilities: (There is no need to simplify the fractions).

1) A bag has 6 balls, 2 red and 4 white. A ball is picked and **not** replaced. A second ball is picked.



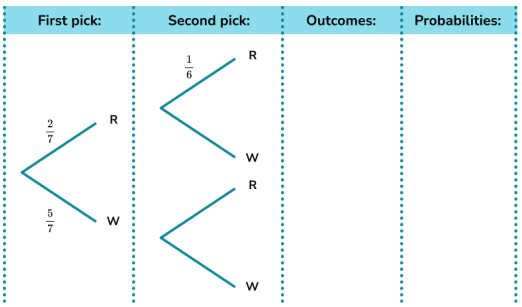
1)



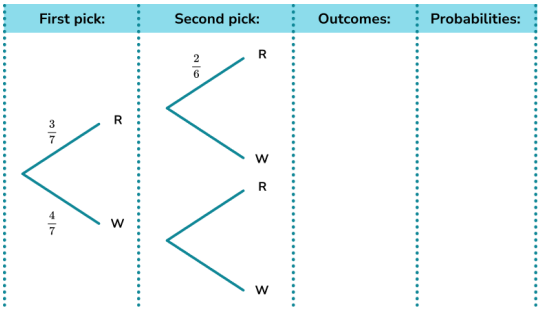
Probability tree diagrams - Answers

Group C contd

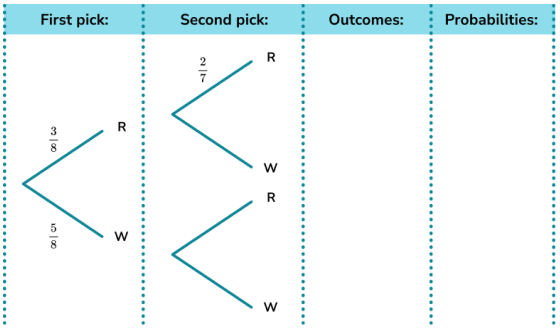
2) A bag has 7 balls, 2 red and 5 white. A ball is picked and **not** replaced. A second ball is picked.



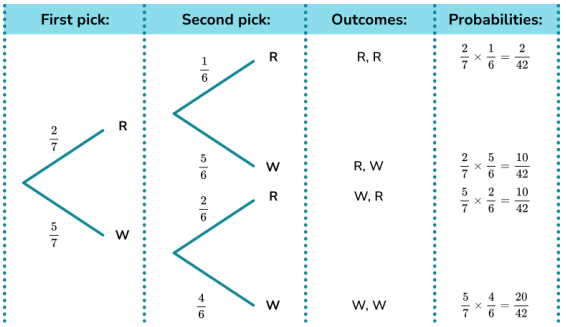
3) A bag has 7 balls, 3 red and 4 white. A ball is picked and **not** replaced. A second ball is picked.



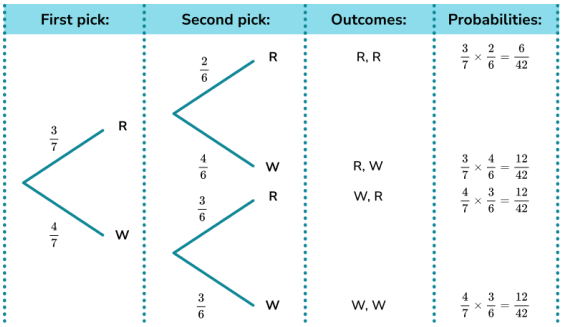
4) A bag has 8 balls, 3 red and 5 white. A ball is picked and **not** replaced. A second ball is picked.



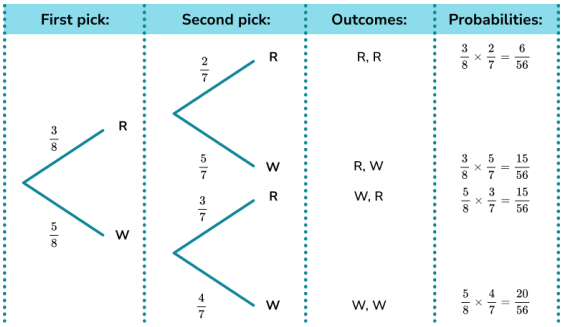
2)



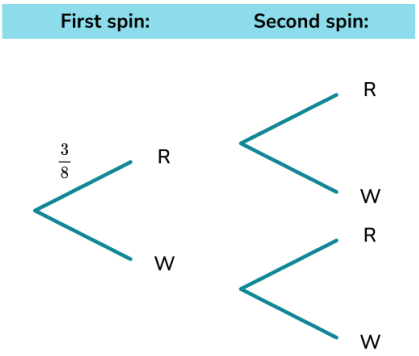
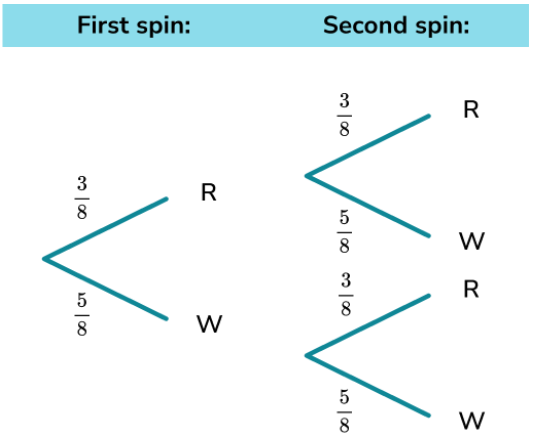
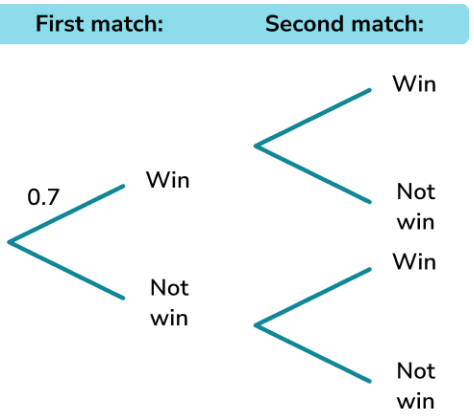
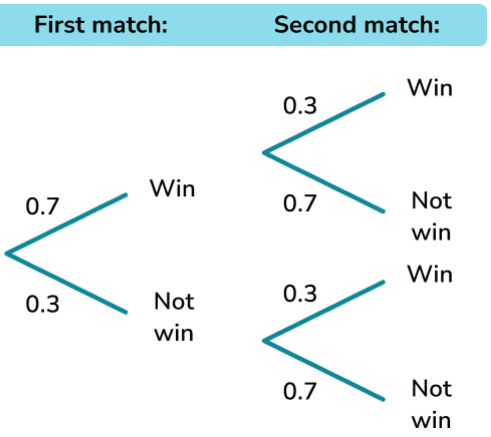
3)



4)



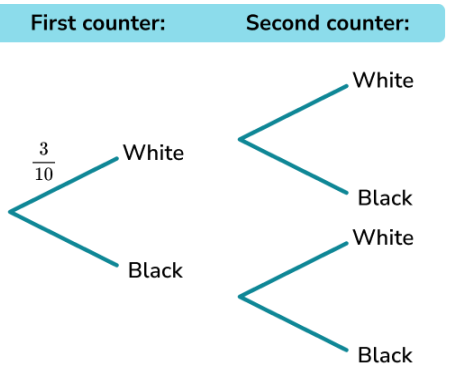
Probability tree diagrams - Answers

	Question	Answer
	Applied Questions	
1)	**a)** A spinner has 8 sections. 3 sections are red and the remaining sections are white. The spinner is spun twice. Fill in the missing probabilities on the tree diagram.  **b)** Work out the probability that the spinner lands on red twice.	**a)**  **b)** $\frac{3}{8} \times \frac{3}{8} = \frac{9}{64}$
2)	**a)** Maria plays tennis. The probability that she wins a match is 0.7. Maria plays 2 matches. Fill in the missing probabilities on the tree diagram.  	**a)** 
	b) Work out the probability that Maria wins at least one match.	**b)** $0.7 \times 0.7 = 0.49$ $0.7 \times 0.3 = 0.21$ $0.3 \times 0.7 = 0.21$ $0.49 + 0.21 + 0.21 = 0.91$

Probability tree diagrams - Answers

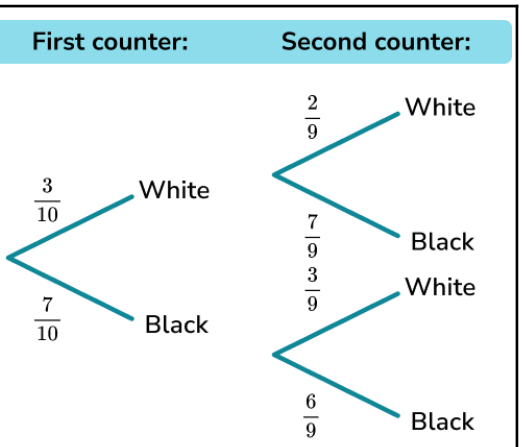
3)

a) 10 counters are in a bag.
There are 3 white counters and the remaining counters are black.
A counter is picked out at random.
It is **not** replaced.
A second counter is picked out at random.
Fill in the missing probabilities on the tree diagram.



b) Work out the probability that one of each colour counter is picked.

a)



b)

$$\frac{3}{10} \times \frac{7}{9} = \frac{21}{90}$$

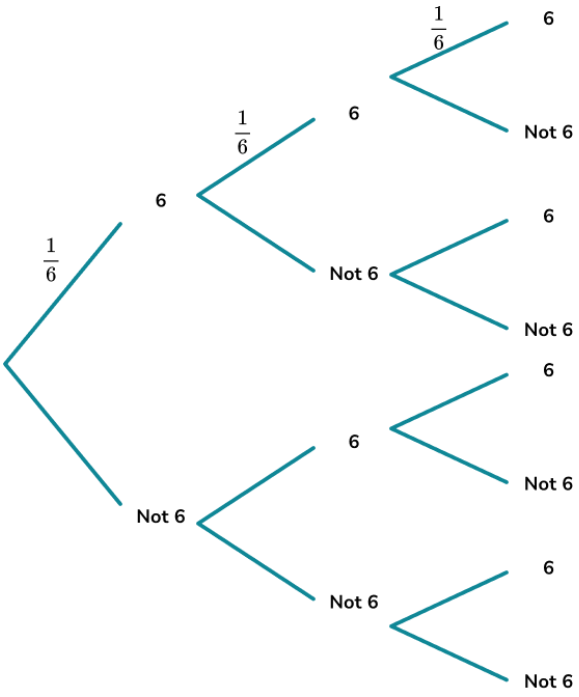
$$\frac{7}{10} \times \frac{3}{9} = \frac{21}{90}$$

$$\frac{21}{90} + \frac{21}{90} = \frac{42}{90} = \frac{7}{15}$$

Probability tree diagrams - Answers

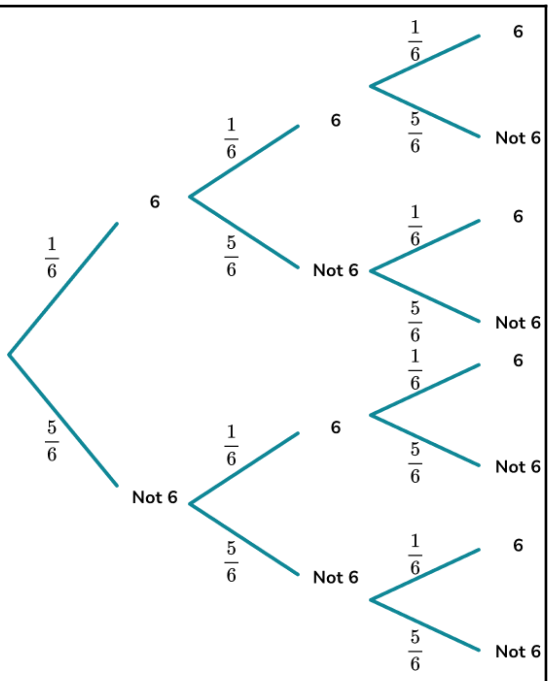
4)

a) Three unbiased dice are rolled.
Fill in the missing probabilities.



b) Work out the probability that only one '6' is rolled.

a)



b)

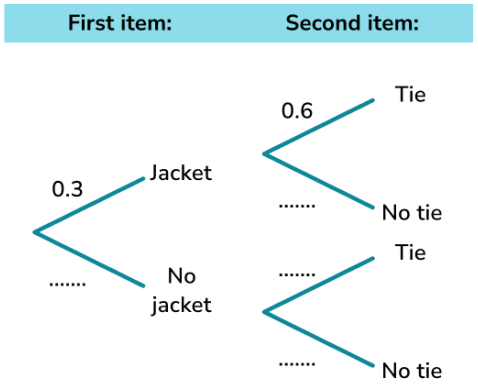
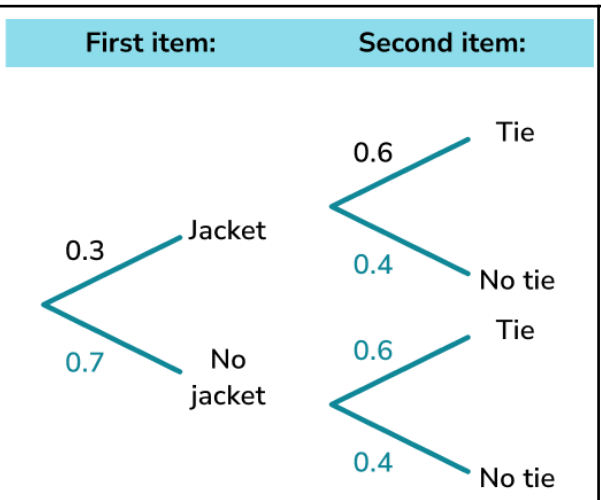
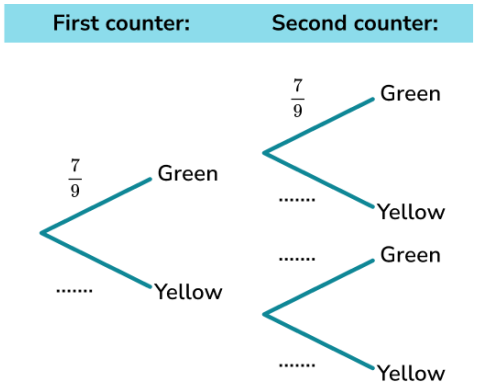
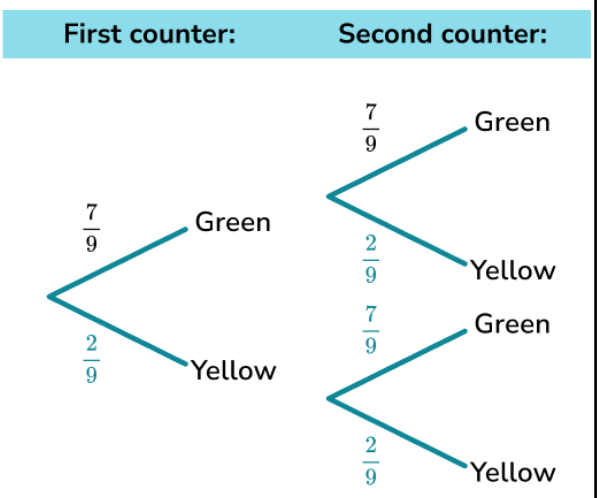
$$\frac{1}{6} \times \frac{5}{6} \times \frac{5}{6} = \frac{25}{216}$$

$$\frac{5}{6} \times \frac{1}{6} \times \frac{5}{6} = \frac{25}{216}$$

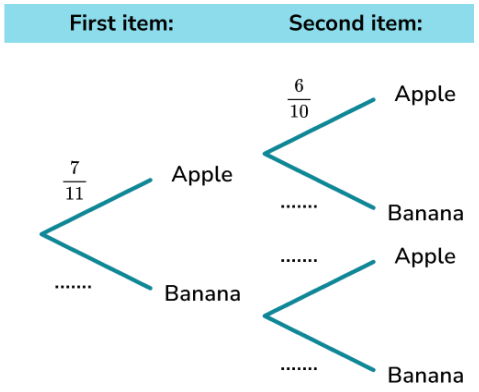
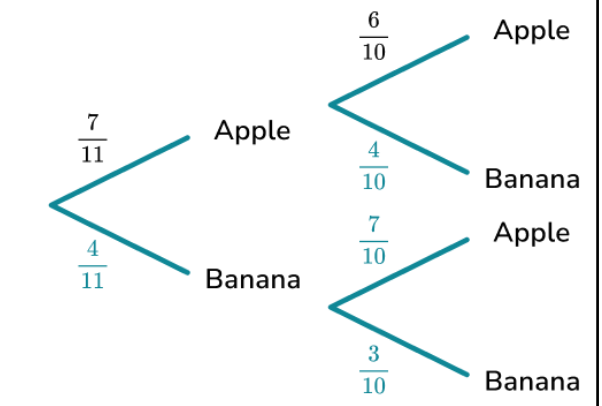
$$\frac{5}{6} \times \frac{5}{6} \times \frac{1}{6} = \frac{25}{216}$$

$$\frac{25}{216} + \frac{25}{216} + \frac{25}{216} = \frac{75}{216} = \frac{25}{72}$$

Probability tree diagrams - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	Mr Jamal gets ready in the morning. The probability he wears a jacket is 0.3. The probability that he wears a tie is 0.6. Complete the tree diagram.  	(a)  0.7 on the first set on branches 0.4, 0.6, 0.4 on the second set of branches	 (1) (1)
(b)	Work out the probability that Mr Jamal wears a jacket and a tie.	(b) 0.3×0.6 $= 0.18$	(1) (1)
2) (a)	A bag contains only green and yellow counters. Sophie picks a counter at random and then replaces it. Sophie then picks a second counter. Complete the tree diagram.  	(a)  $\frac{2}{9}$ on the first set on branches $\frac{2}{9}, \frac{7}{9}, \frac{2}{9}$ on the second set of branches	 (1) (1)

Probability tree diagrams - Mark Scheme

(b)	Work out the probability that Sophie picks 2 green counters.	**(b)** $\frac{7}{9} \times \frac{7}{9}$ $= \frac{49}{81}$	**(1)** **(1)**
(c)	Work out the probability that Sophie picks at least one green counter.	**(c)** $\left(\frac{7}{9} \times \frac{7}{9}\right) + \left(\frac{7}{9} \times \frac{2}{9}\right) + \left(\frac{2}{9} \times \frac{7}{9}\right)$ $= \frac{49}{81} + \frac{14}{81} + \frac{14}{81} = \frac{77}{81}$	**(1)** **(1)**
3) (a)	There are 7 apples and 4 bananas in a fruit bowl. A piece of fruit is selected at random. It is eaten. A second piece of fruit is selected at random and is also eaten. Complete the tree diagram. 	**(a)**  $\frac{4}{11}$ on the first set on branches $\frac{4}{10}, \frac{7}{10}, \frac{3}{10}$ on the second set of branches	 **(1)** **(1)**
(b)	Work out the probability that one of each type of fruit is eaten.	**(b)** $\frac{7}{11} \times \frac{4}{10} = \frac{28}{110}$ **or** $\frac{4}{11} \times \frac{7}{10} = \frac{28}{110}$ "$\frac{28}{110}$" + "$\frac{28}{110}$" $= \frac{56}{110}$ **oe**	**(1)** **(1)** **(1)**