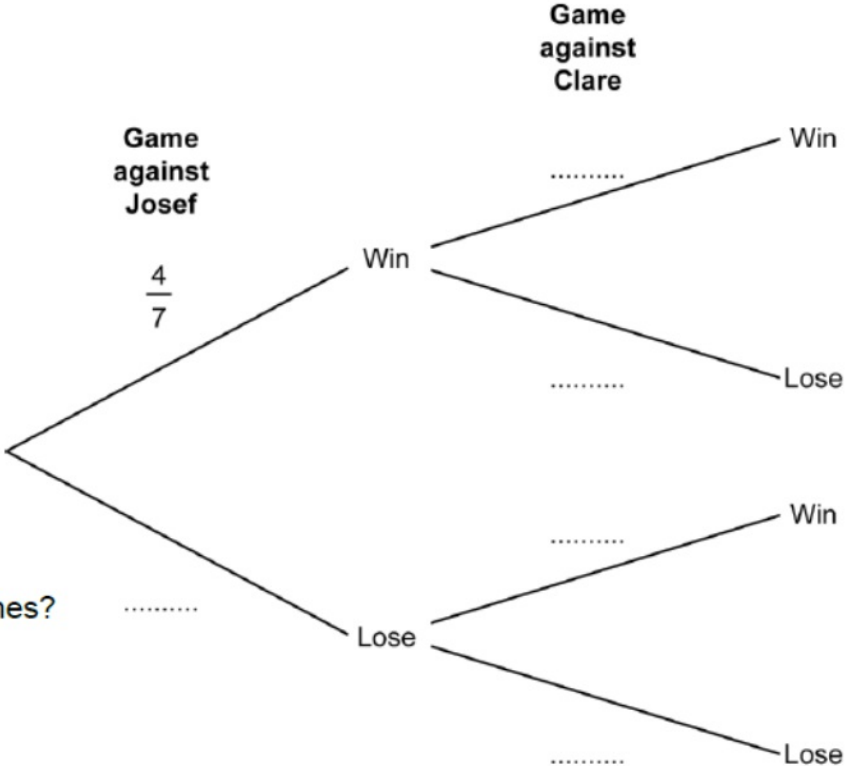


# P32- Probability Tree Diagrams- Independent Events

OCR

14 Kyle plays in a chess league.  
He has to play Josef and then play Clare.  
The probability of winning against Josef is  $\frac{4}{7}$ .  
The probability of winning against Clare is  $\frac{3}{5}$ .  
Kyle does not draw any games.

(a) Complete the tree diagram.



(b) What is the probability that Kyle will win both games? .....

(c) What is the probability that Kyle will win exactly one of the two games?

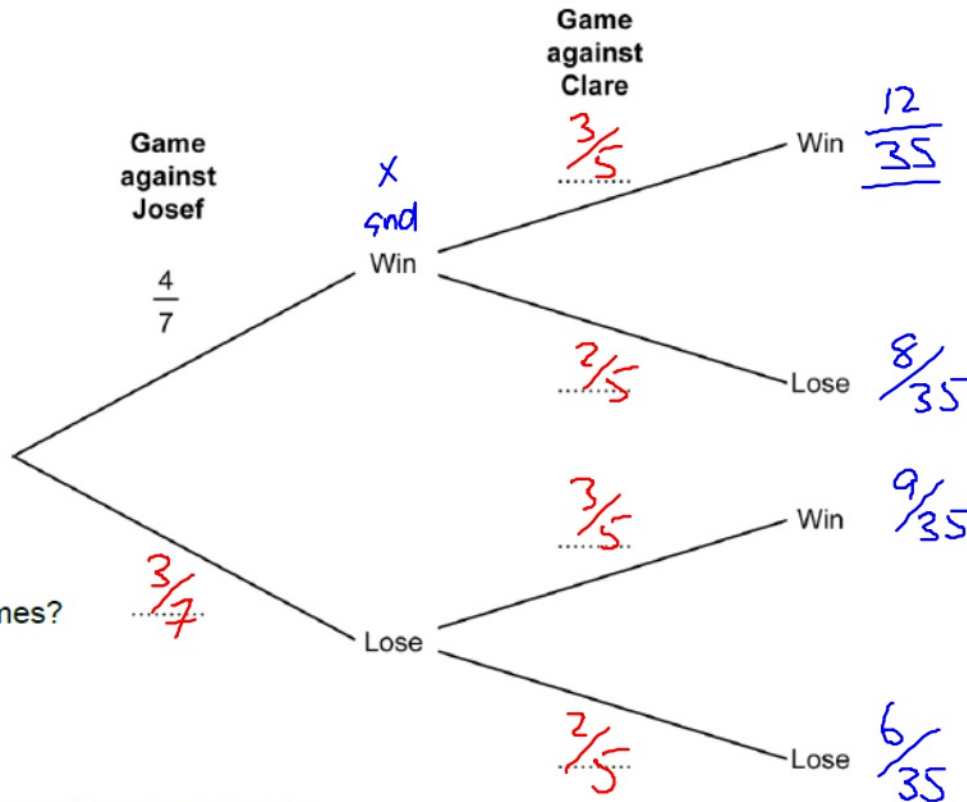
14 Kyle plays in a chess league.  
He has to play Josef and then play Clare.

The probability of winning against Josef is  $\frac{4}{7}$ .

The probability of winning against Clare is  $\frac{3}{5}$ .

Kyle does not draw any games.

(a) Complete the tree diagram.



'and' =  $\times$   
'or' =  $+$

(b) What is the probability that Kyle will win both games?

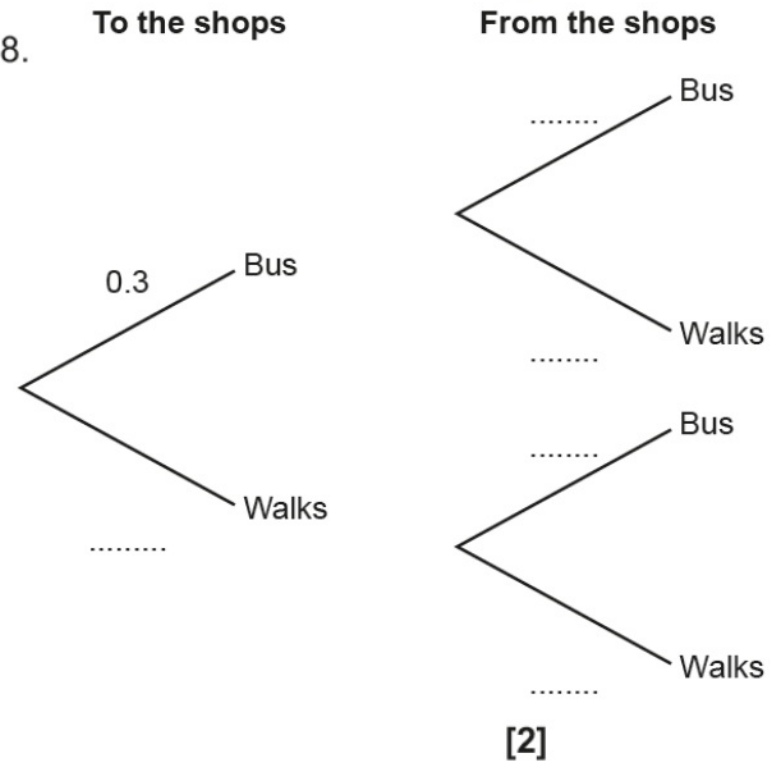
$\frac{4}{7} \times \frac{3}{5} = \frac{12}{35}$

(c) What is the probability that Kyle will win exactly one of the two games?

$\frac{8}{35} + \frac{9}{35} = \frac{17}{35}$  ✓

- 19 Kirsty either travels by bus or walks when she visits the shops.  
 The probability that she catches the bus **to** the shops is 0.3.  
 The probability that she catches the bus **from** the shops is 0.8.

Video created by W Neill



- (a) Complete the tree diagram.
- (b) Show that the probability that Kirsty walks at least one way is 0.76.

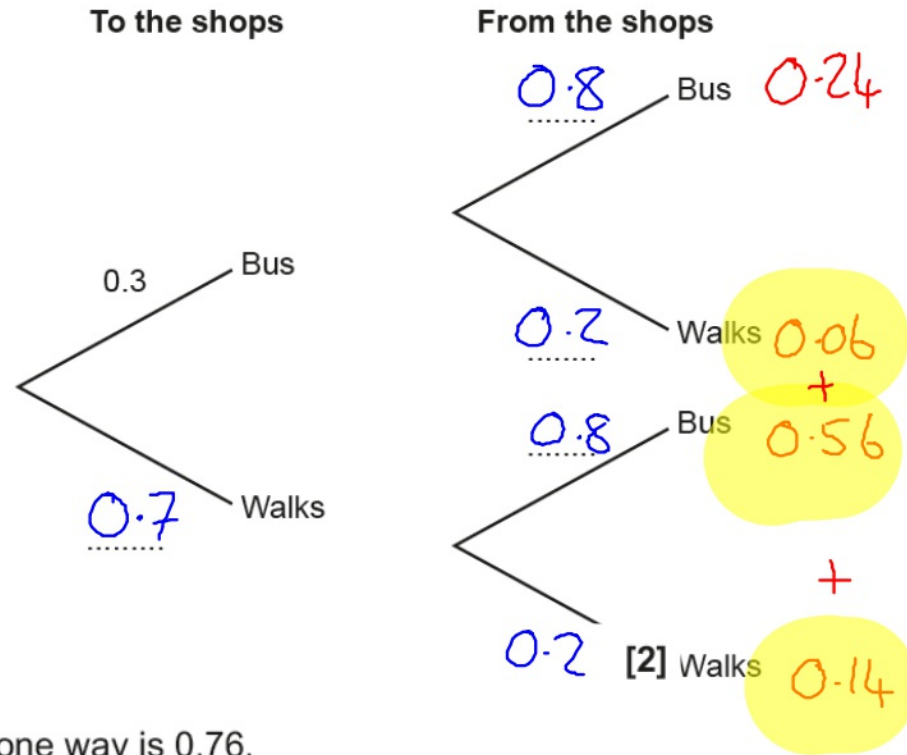
..... [2]

- 19 Kirsty either travels by bus or walks when she visits the shops.  
 The probability that she catches the bus **to** the shops is 0.3.  
 The probability that she catches the bus **from** the shops is 0.8.

Video created by W Neill

Bus and Walks

'and'  
x  
 'or'  
+



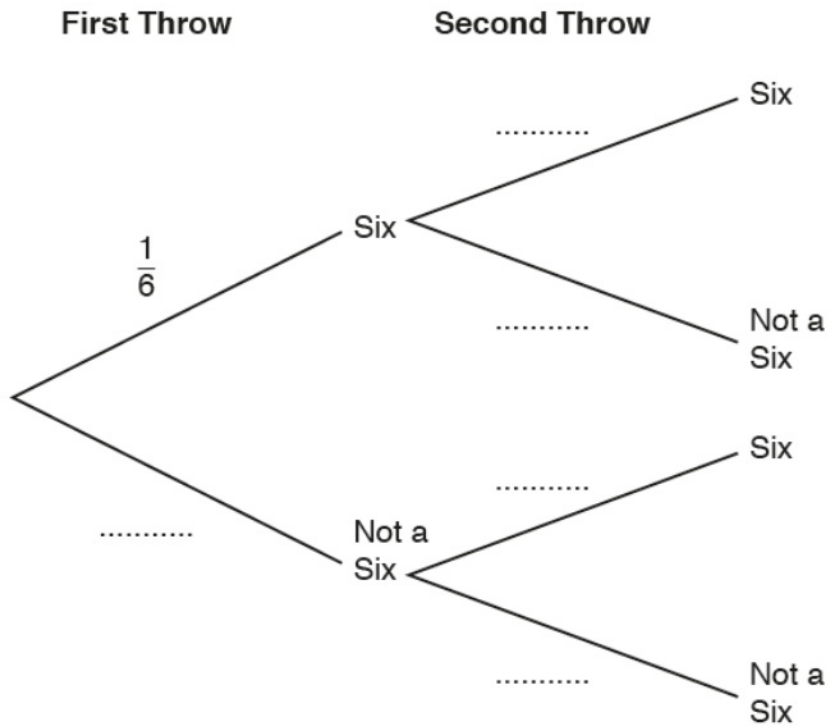
- (a) Complete the tree diagram.  
 (b) Show that the probability that Kirsty walks at least one way is 0.76.

$$0.06 + 0.56 + 0.14 = 0.76 \checkmark$$

..... [2]

21 (a) Noah starts to draw a tree diagram showing the outcomes of throwing a six when a fair dice is thrown twice.

Created by W Neill



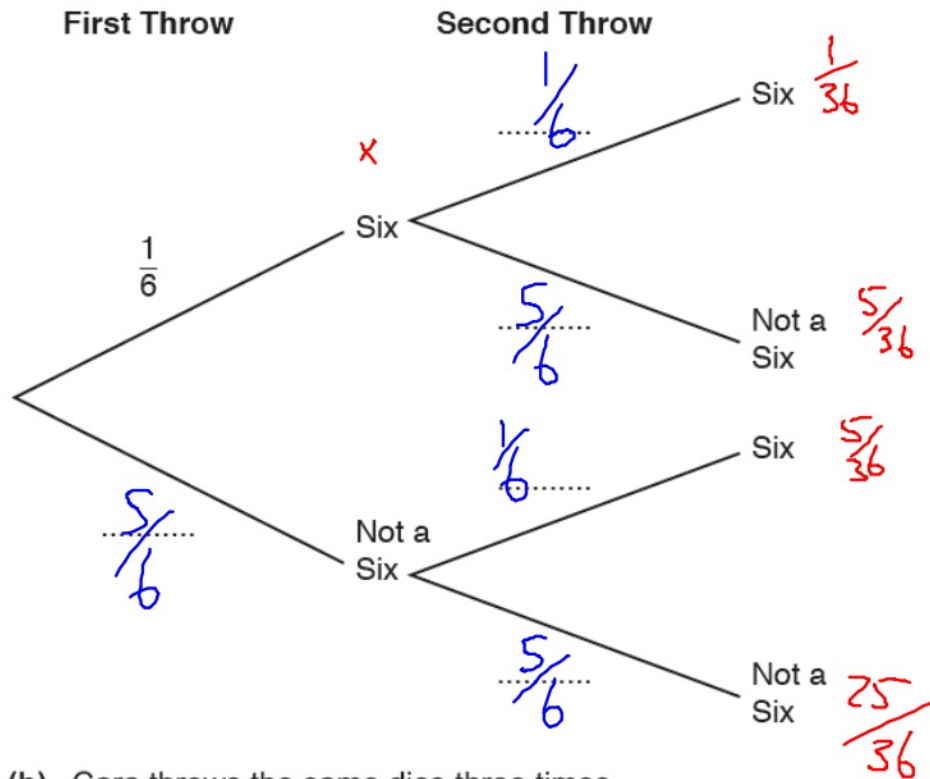
(i) Complete the tree diagram.

(ii) What is the probability of throwing two sixes?

(b) Cara throws the same dice three times.

Show that the probability that Cara does not throw a six until her third throw is  $\frac{25}{216}$ . [2]

- 21 (a) Noah starts to draw a tree diagram showing the outcomes of throwing a six when a fair dice is thrown twice. Created by W Neill



- (i) Complete the tree diagram.  
(ii) What is the probability of throwing two sixes?

$$\frac{1}{36} \checkmark$$

'and' =  $\times$   
'or' =  $+$

- (b) Cara throws the same dice three times.

Show that the probability that Cara does not throw a six until her third throw is  $\frac{25}{216}$ . [2]

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



**16** Finn has two bags of counters.  
He takes a counter at random from each bag.

The probability that he takes a red counter from the first bag is 0.3.  
The probability that he takes a red counter from the second bag is 0.4.

What is the probability that he takes **at least** one red counter?

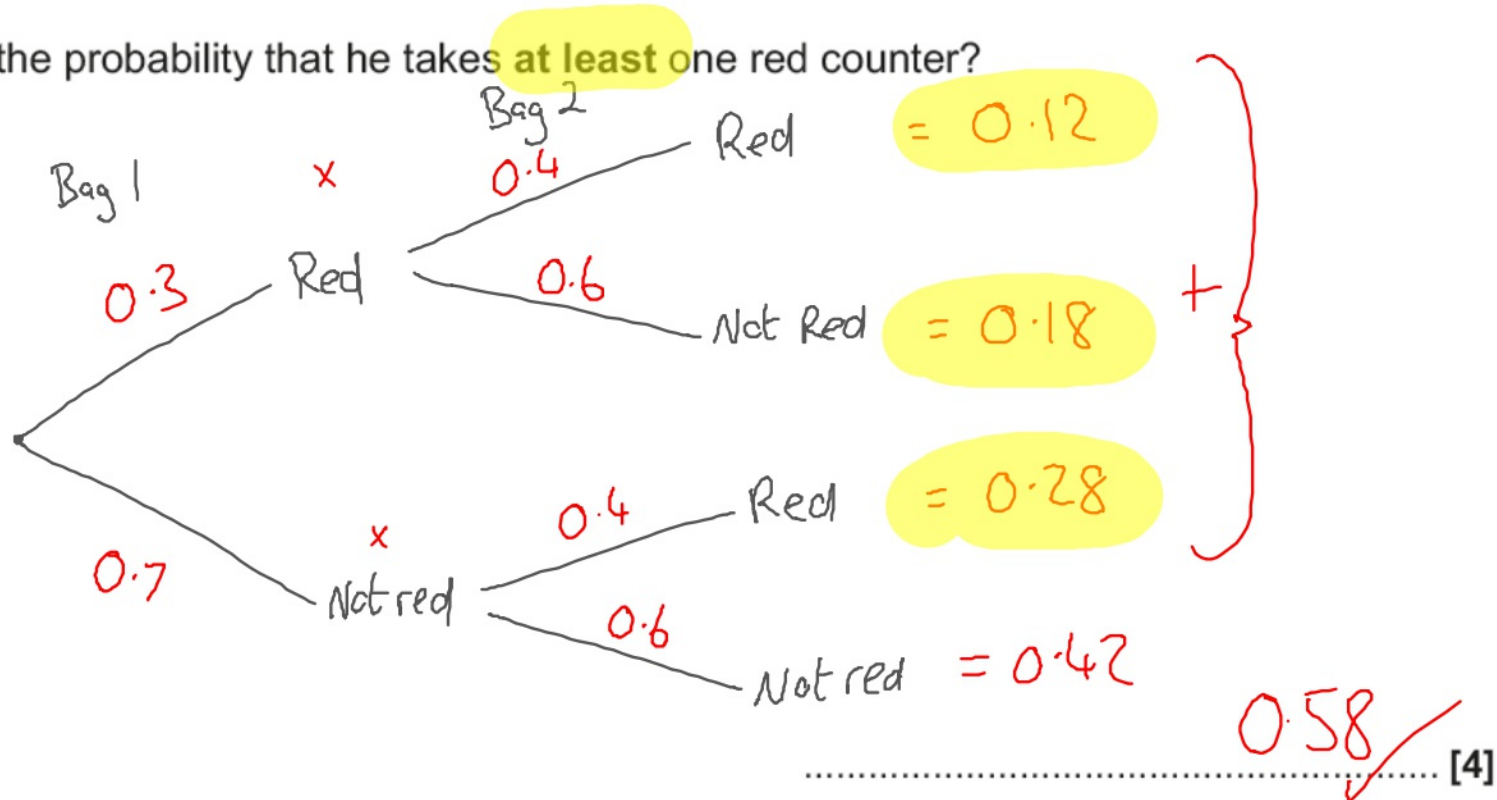
..... [4]

16 Finn has two bags of counters.  
He takes a counter at random from each bag.

Created by W Neill

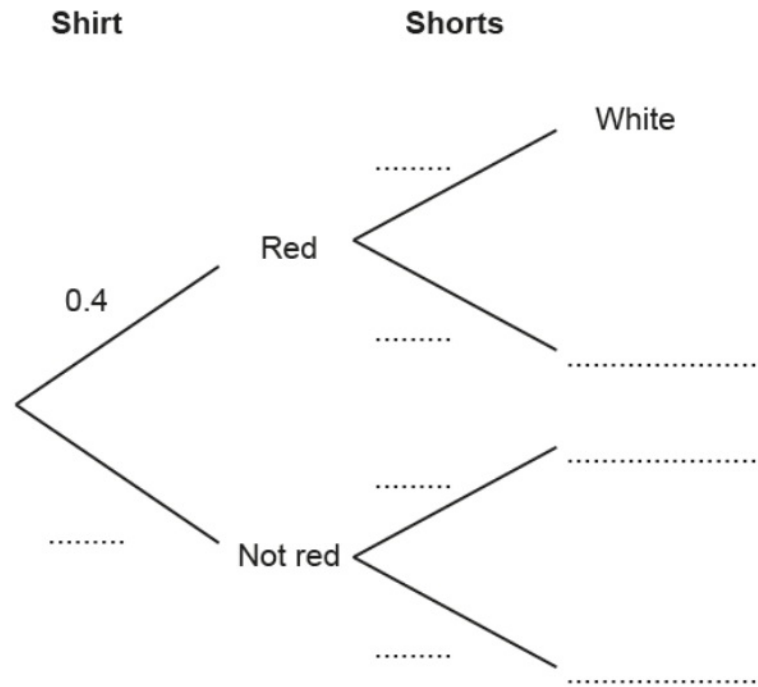
P32 The probability that he takes a red counter from the first bag is 0.3.  
The probability that he takes a red counter from the second bag is 0.4.

What is the probability that he takes **at least one** red counter?



**24** Romelu picks a shirt and shorts.  
The probability he picks a red shirt is 0.4.  
**P32** The probability he picks white shorts is 0.7.

**(a)** Complete the tree diagram. [3]

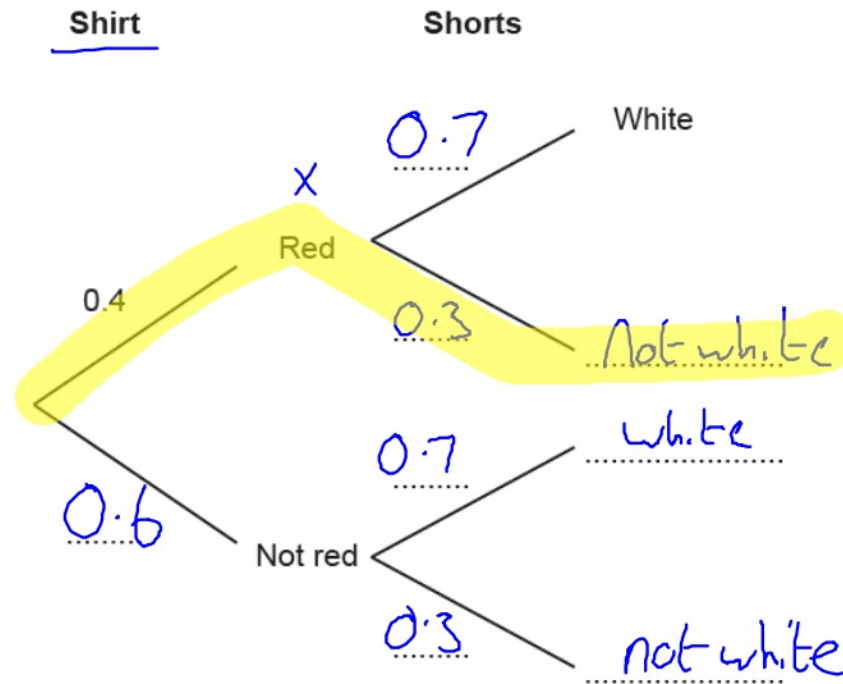


**(b)** Calculate the probability that Romelu picks a red shirt but does not pick white shorts.

**(b)** ..... [2]

- 24 Romelu picks a shirt and shorts.  
 The probability he picks a red shirt is 0.4.  
 P32 The probability he picks white shorts is 0.7.

(a) Complete the tree diagram. [3]



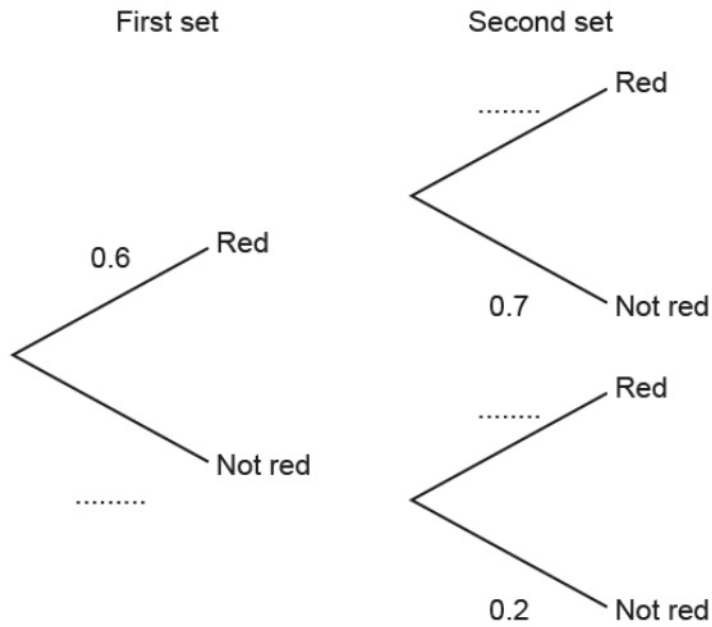
(b) Calculate the probability that Romelu picks a red shirt but does not pick white shorts.

$$0.4 \times 0.3$$

(b) .....  $0.12$  ✓ ..... [2]

- 13 Rashid drives his car along a road passing through two sets of traffic lights. The tree diagram shows the probabilities of the lights being **red** when he reaches them.

Video created by W Neill



(a) Complete the tree diagram. [1]

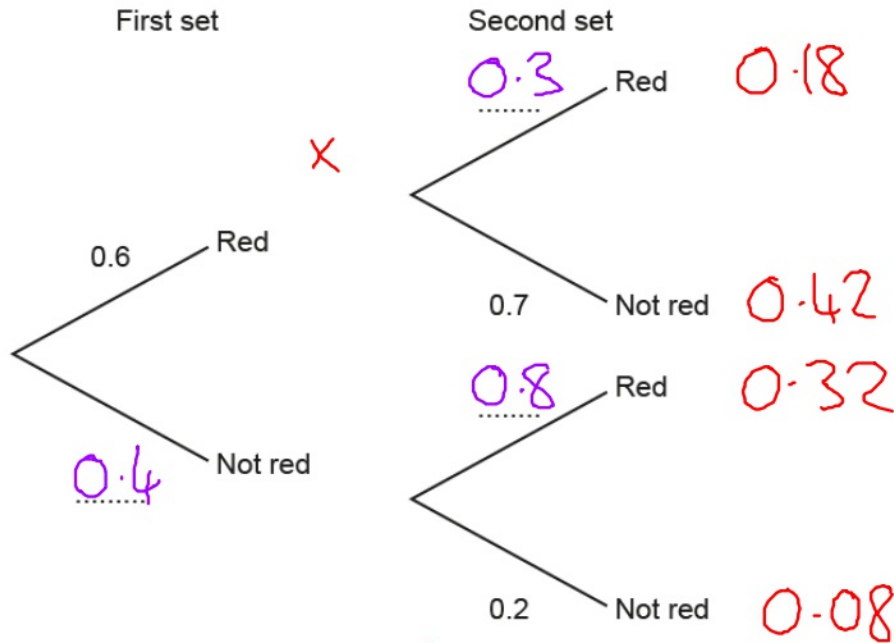
(b) Write down the probability that the first set is **not red**.

(b) ..... [1]

13 Rashid drives his car along a road passing through two sets of traffic lights. The tree diagram shows the probabilities of the lights being **red** when he reaches them.

Video created by W Neill

P32



(a) Complete the tree diagram. ✓ [1]

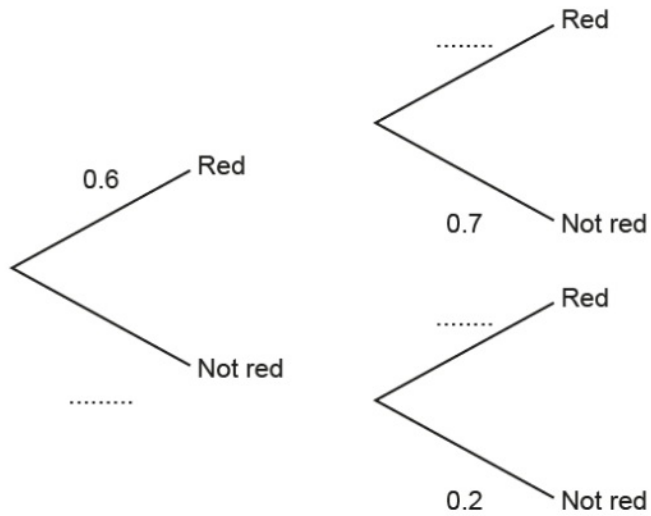
(b) Write down the probability that the first set is **not red**.

(b) ..... 0.4 ..... [1]

First set

Second set

Video created by W Neill



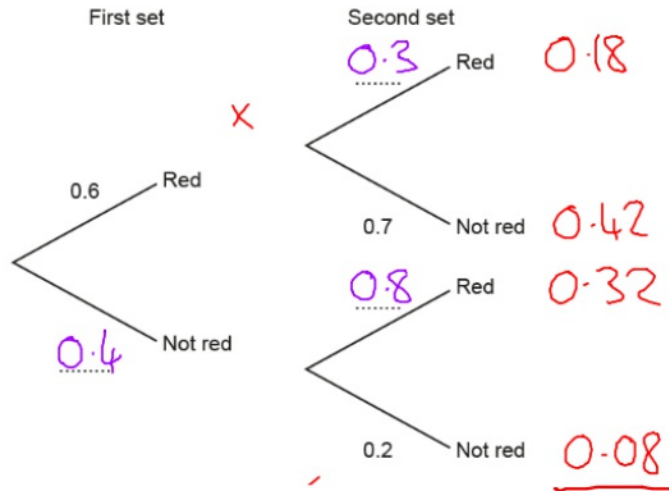
(c) Given that the first set is **red**, write down the probability that the second set is **not red**.

(c) ..... [1]

(d) Work out the probability that both sets are **not red**.

(d) ..... [2]

Video created by W Neill



(c) Given that the first set is **red**, write down the probability that the second set is **not red**.

(c) ..... 0.7 ..... [1]

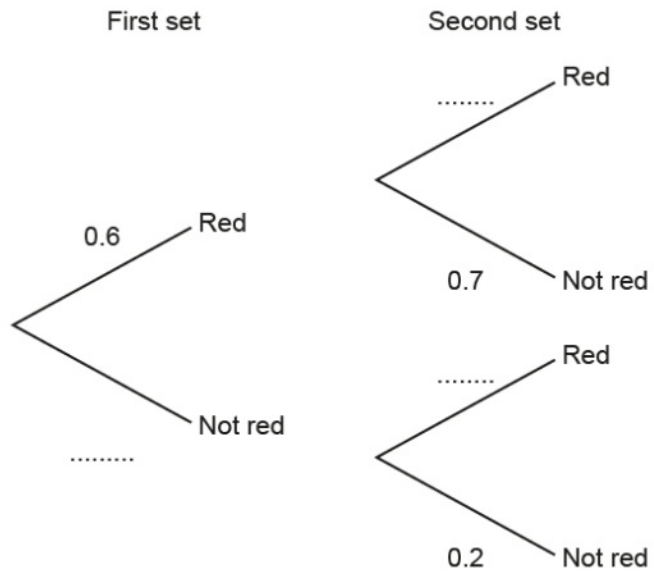
(d) Work out the probability that both sets are **not red**.

not red and not red  
x

(d) ..... 0.08 ..... [2]



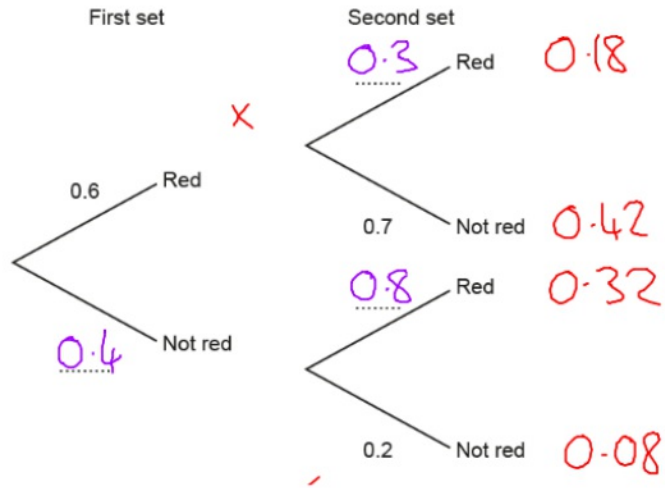
Video created by W Neill



(e) Work out the probability that at least one set is **not red**.

(e) ..... [3]

Video created by W Neill



and = X  
or = +

(e) Work out the probability that at least one set is **not red**.

$(R \text{ and } NR) \text{ or } (NR \text{ \& } R) \text{ or } (NR \text{ \& } NR)$

$$0.6 \times 0.7$$

$$= 0.42 + 0.32 + 0.08$$

0.82 ✓

(e) ..... [3]

- 7 The probability that any postcard posted in Portugal on Monday is delivered to the UK within a week is 0.62.  
The probability that any postcard posted in Portugal on Friday is delivered to the UK within a week is 0.41.

(a) Anna is on holiday in Portugal.  
She posts 15 postcards to the UK on Monday.

**P26** How many of her postcards can she expect to be delivered within a week?

(a) ..... [2]

- 7 The probability that any postcard posted in Portugal on Monday is delivered to the UK within a week is 0.62.  
The probability that any postcard posted in Portugal on Friday is delivered to the UK within a week is 0.41.

- (a) Anna is on holiday in Portugal.  
She posts 15 postcards to the UK on Monday.

**P26** How many of her postcards can she expect to be delivered within a week?

$$0.62 \text{ of } 15 = 9.3$$

x

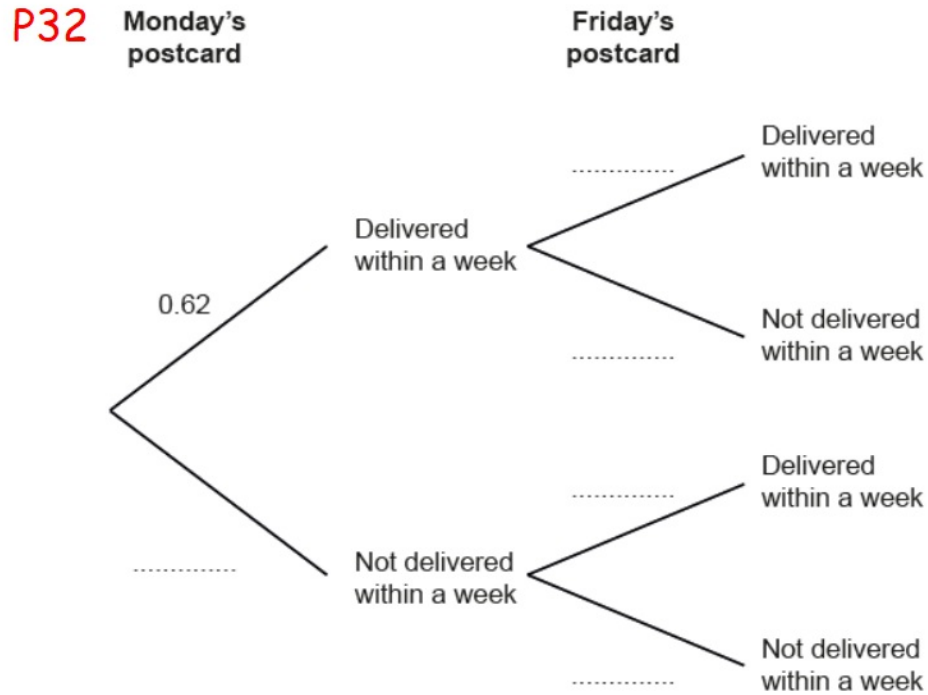
(a) ..... [2]

9 ✓

or  
10 ✓

- (b) Sergio is in Portugal.  
 He posts one postcard to the UK on Monday.  
 He posts another postcard to the UK on Friday.

(i) Complete the probability tree to show the possible outcomes for the postcards.



[2]

(ii) Calculate the probability that only one of Sergio's postcards is delivered within a week.

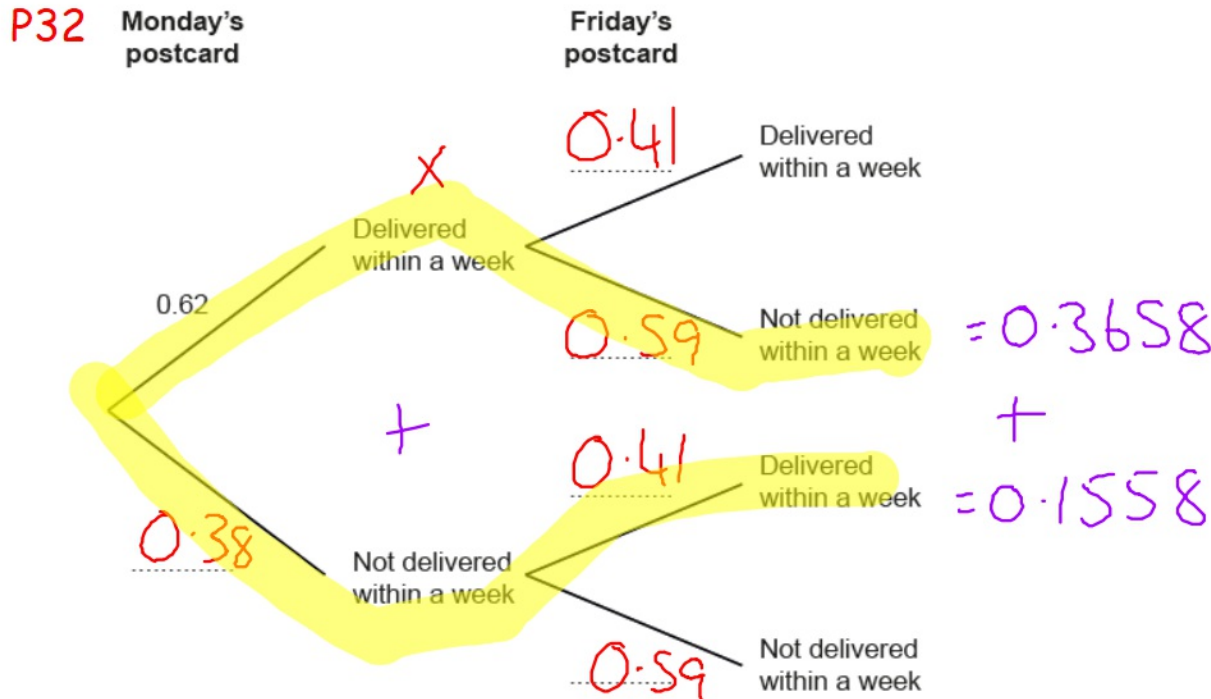
**P32**

(b)(ii) ..... [3]

(b) Sergio is in Portugal.  
 He posts one postcard to the UK on Monday.  
 He posts another postcard to the UK on Friday.

and = X  
 or = +

(i) Complete the probability tree to show the possible outcomes for the postcards.



[2]

(ii) Calculate the probability that only one of Sergio's postcards is delivered within a week.

**P32**

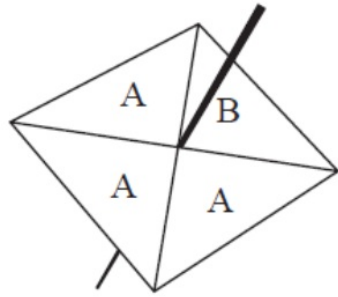
(b)(ii) ..... [3]

0.5216 ✓

Edexcel

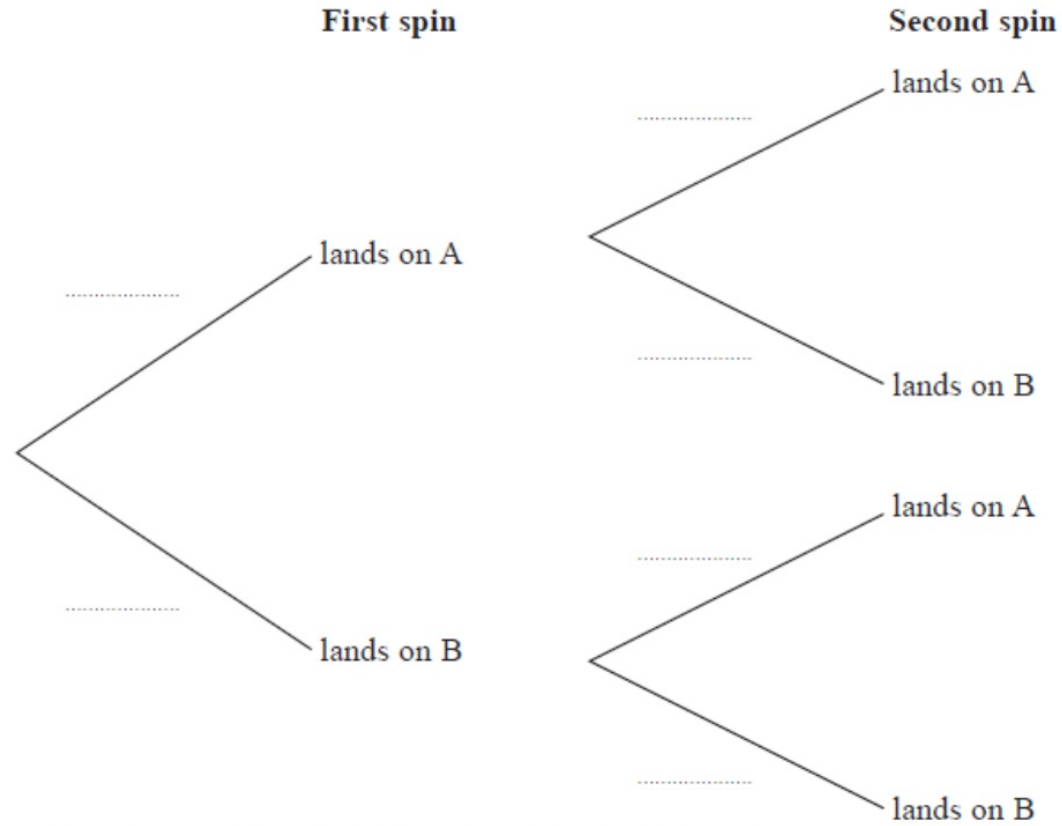
22 The diagram shows a fair 4-sided spinner.

Created by W Neill



Hasmeet is going to spin the spinner twice.

(a) Complete the probability tree diagram.



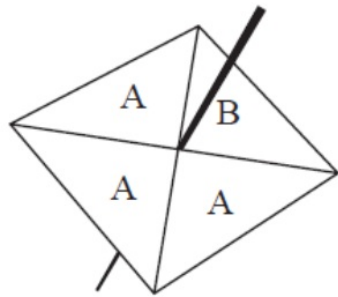
(b) Work out the probability that the spinner will land on A on the first spin and will land on B on the second spin.

(2)



4 The diagram shows a fair 4-sided spinner.

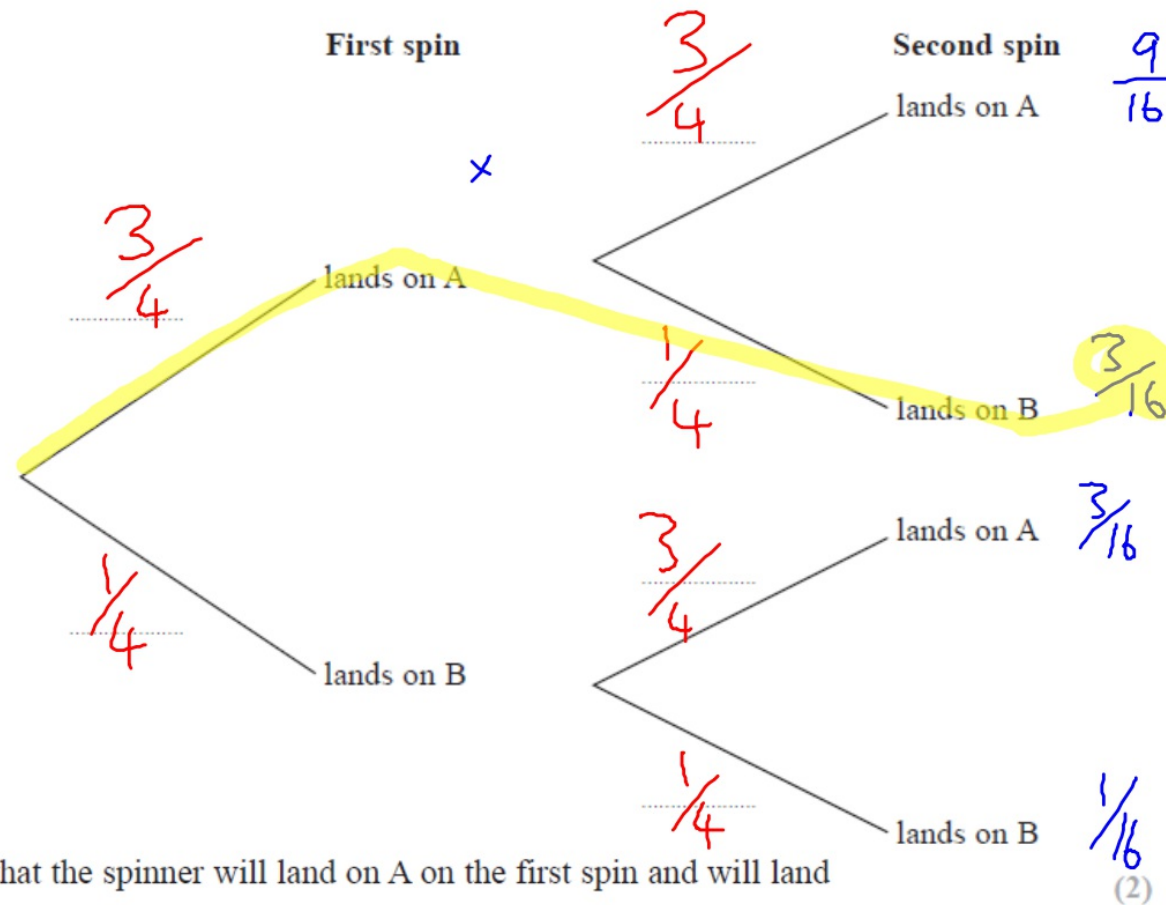
Created by W Neill



Hasmeet is going to spin the spinner twice.

and = x  
or = +

(a) Complete the probability tree diagram.



(b) Work out the probability that the spinner will land on A on the first spin and will land on B on the second spin.

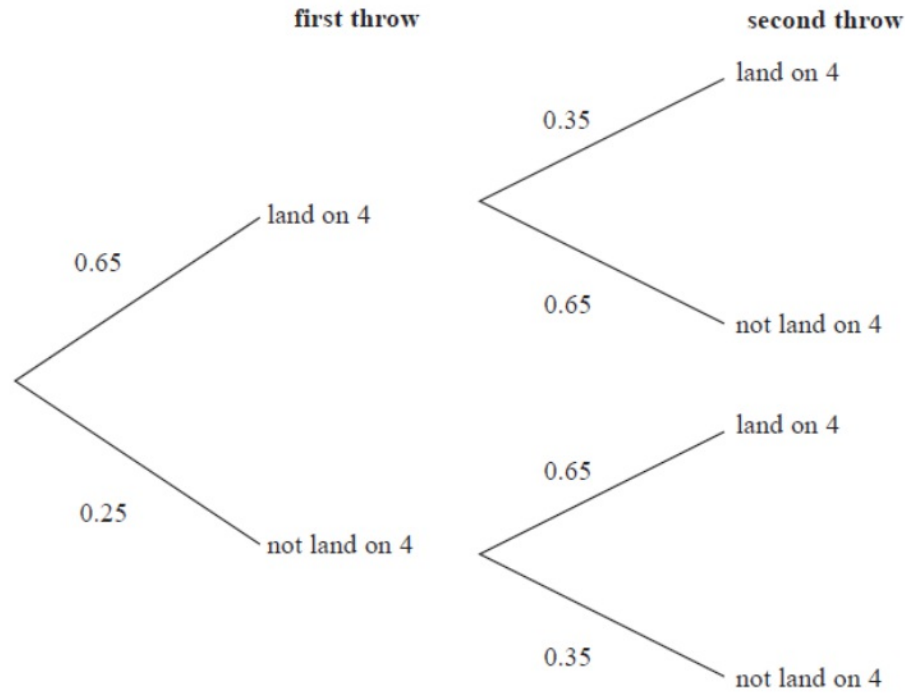
$$\frac{3}{16}$$

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.

Video created by W Neill

Amir draws this probability tree diagram.  
The diagram is **not** correct.

p32



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

1.....

.....

2.....

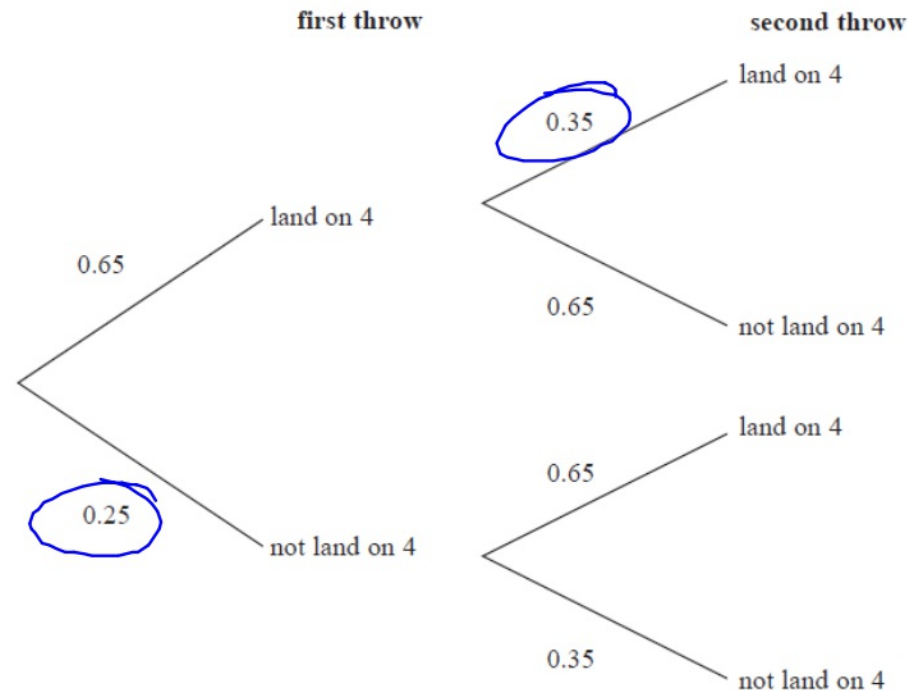
.....

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.

Video created by W Neill

Amir draws this probability tree diagram.  
The diagram is **not** correct.

p32



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

1. Not land on a 4 on 1<sup>st</sup> throw should be 0.35

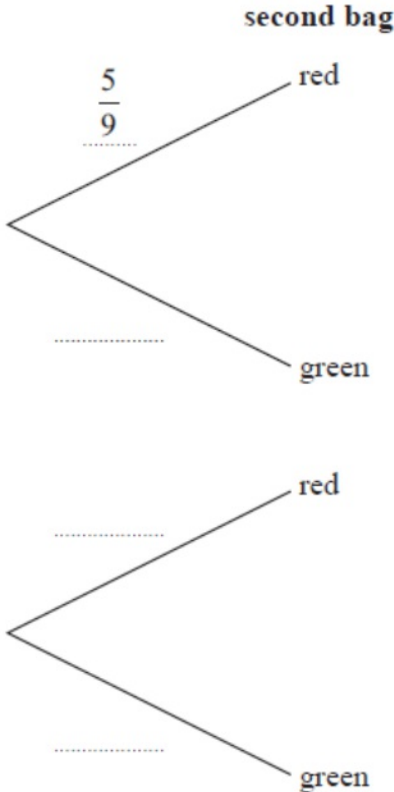
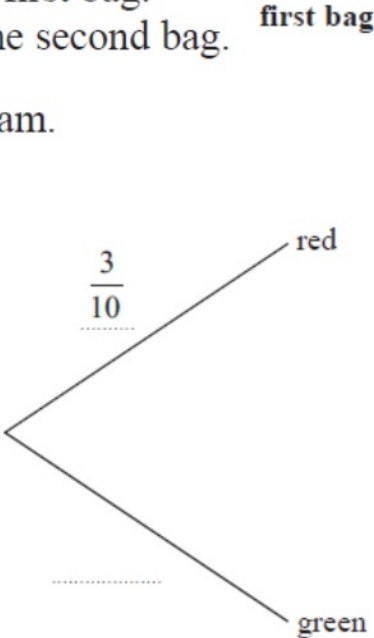
2. Same dice, it should still be 0.65 for landing on a 4 in the second throw.

27 Amina has two bags.

**P32** 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.



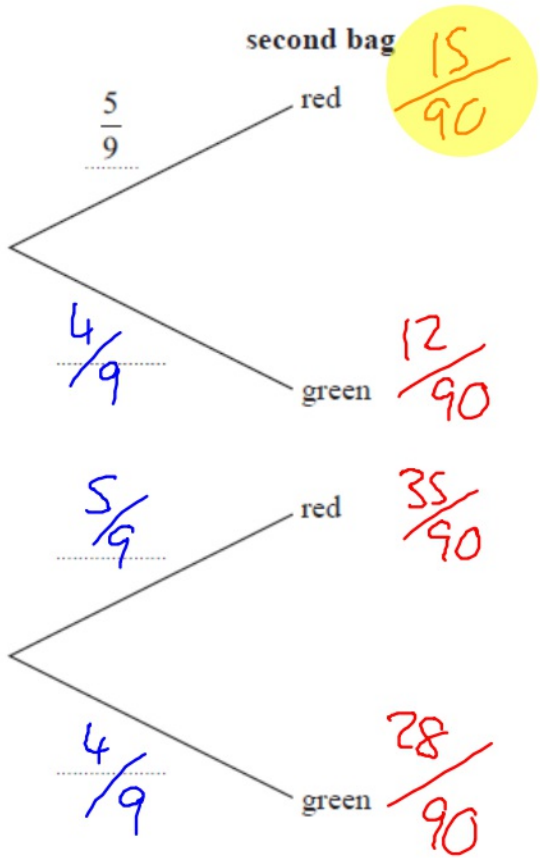
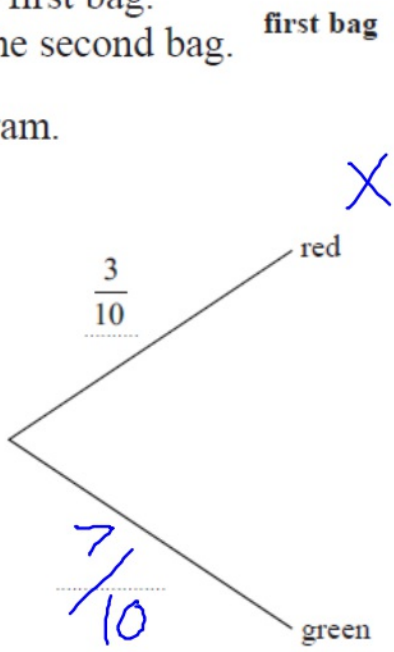
(b) Work out the probability that Amina takes two red balls.

27 Amina has two bags.

P32 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.



R and R  
 $\frac{3}{10} \times \frac{5}{9} = \frac{15}{90}$

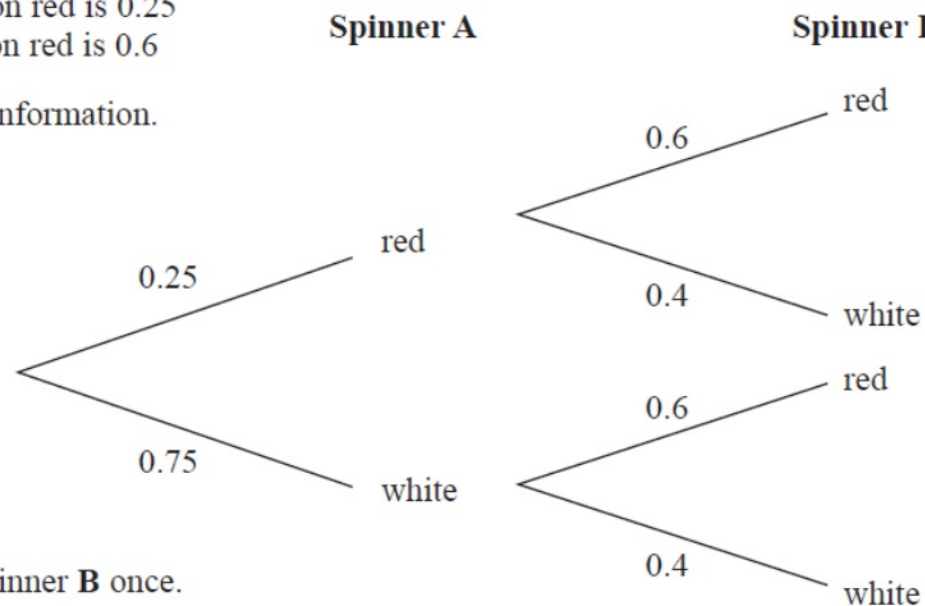
(b) Work out the probability that Amina takes two red balls.

**12** Alan has two spinners, spinner **A** and spinner **B**.  
Each spinner can land on only red or white.

Created by W Neill

The probability that spinner **A** will land on red is 0.25  
The probability that spinner **B** will land on red is 0.6

The probability tree diagram shows this information.



Alan spins spinner **A** once and he spins spinner **B** once.  
He does this a number of times.

The number of times **both** spinners land on red is 24

Work out an estimate for the number of times **both** spinners land on white.

.....  
(Total for Question 12 is 3 marks)



12 Alan has two spinners, spinner A and spinner B.  
Each spinner can land on only red or white.

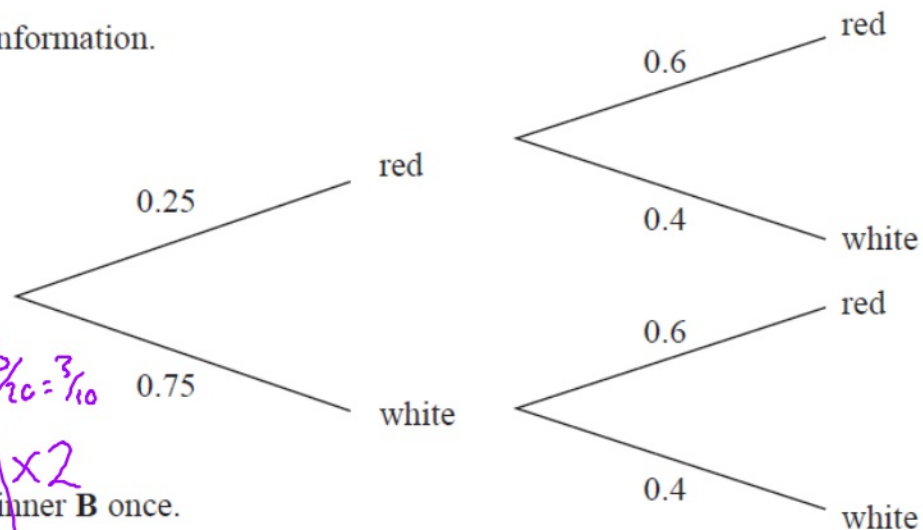
The probability that spinner A will land on red is 0.25  
The probability that spinner B will land on red is 0.6

The probability tree diagram shows this information.

'and' = X  
'or' = +  
Spinner A

Created by W Neill

Spinner B



Red and Red

$$0.25 \times 0.6 = \frac{3}{20}$$

$$\frac{3}{20} = 24 \text{ times}$$

$$\frac{6}{20} = \frac{3}{10}$$

x2

Alan spins spinner A once and he spins spinner B once.  
He does this a number of times.

The number of times **both** spinners land on red is 24

Work out an estimate for the number of times **both** spinners land on white.

white and white

$$0.75 \times 0.4 = \frac{3}{10}$$

48 times.

(Total for Question 12 is 3 marks)

16 There are only red counters and blue counters in a bag.

P31 Joe takes at random a counter from the bag.

P32 The probability that the counter is red is 0.65

Joe puts the counter back into the bag.

Mary takes at random a counter from the bag.

She puts the counter back into the bag.

(a) What is the probability that Joe and Mary take counters of different colours?



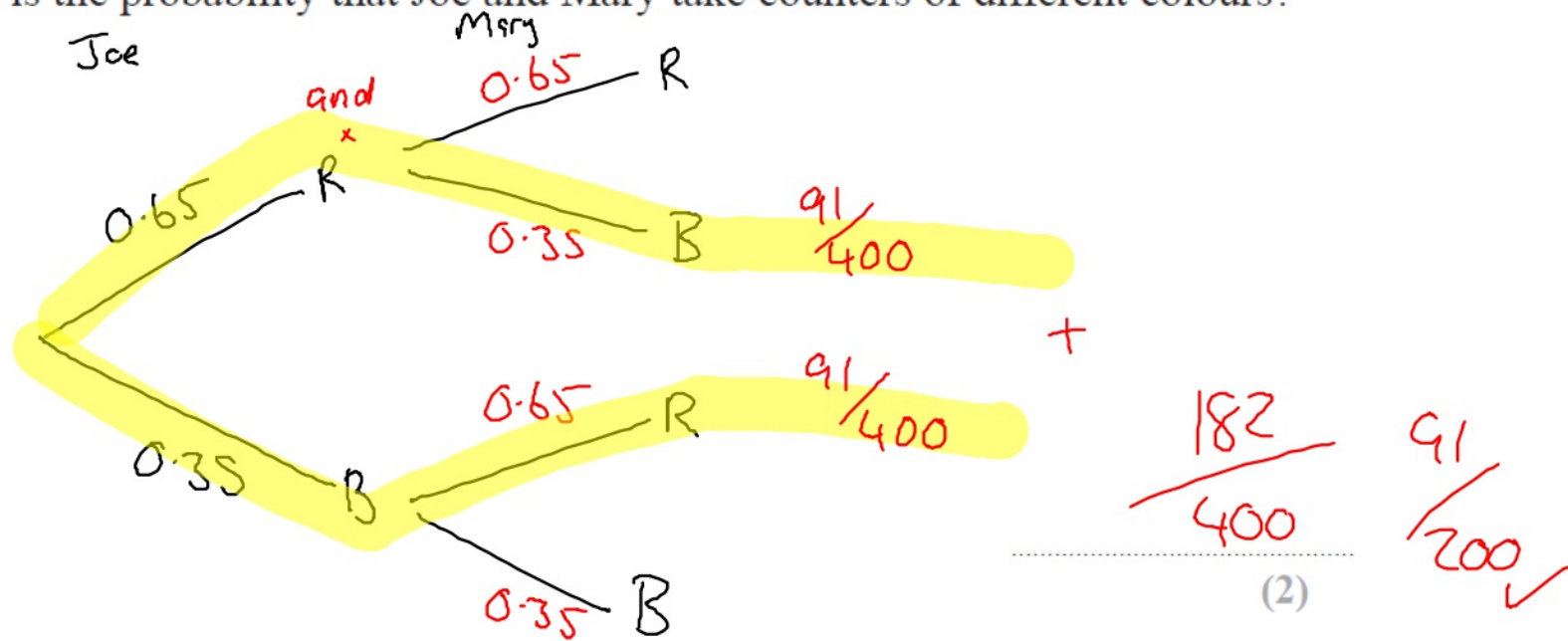
16 There are only red counters and blue counters in a bag.

P31 Joe takes at random a counter from the bag.

P32 The probability that the counter is red is 0.65  
Joe puts the counter back into the bag.

Mary takes at random a counter from the bag.  
She puts the counter back into the bag.

(a) What is the probability that Joe and Mary take counters of different colours?



AQA

Video created by W Neill

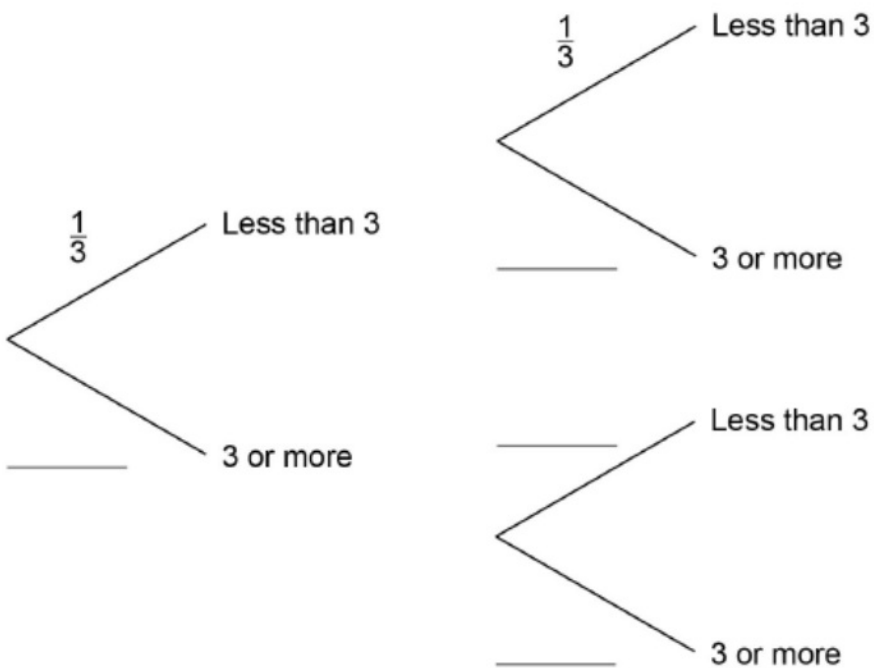
22 Two ordinary fair dice are rolled.

1st dice

2nd dice

22 (a) Complete the tree diagram. [1 mark]

P32



22 (b) Work out the probability that **both** dice land on a number less than 3

Answer \_\_\_\_\_ [1 mark]

Video created by W Neill

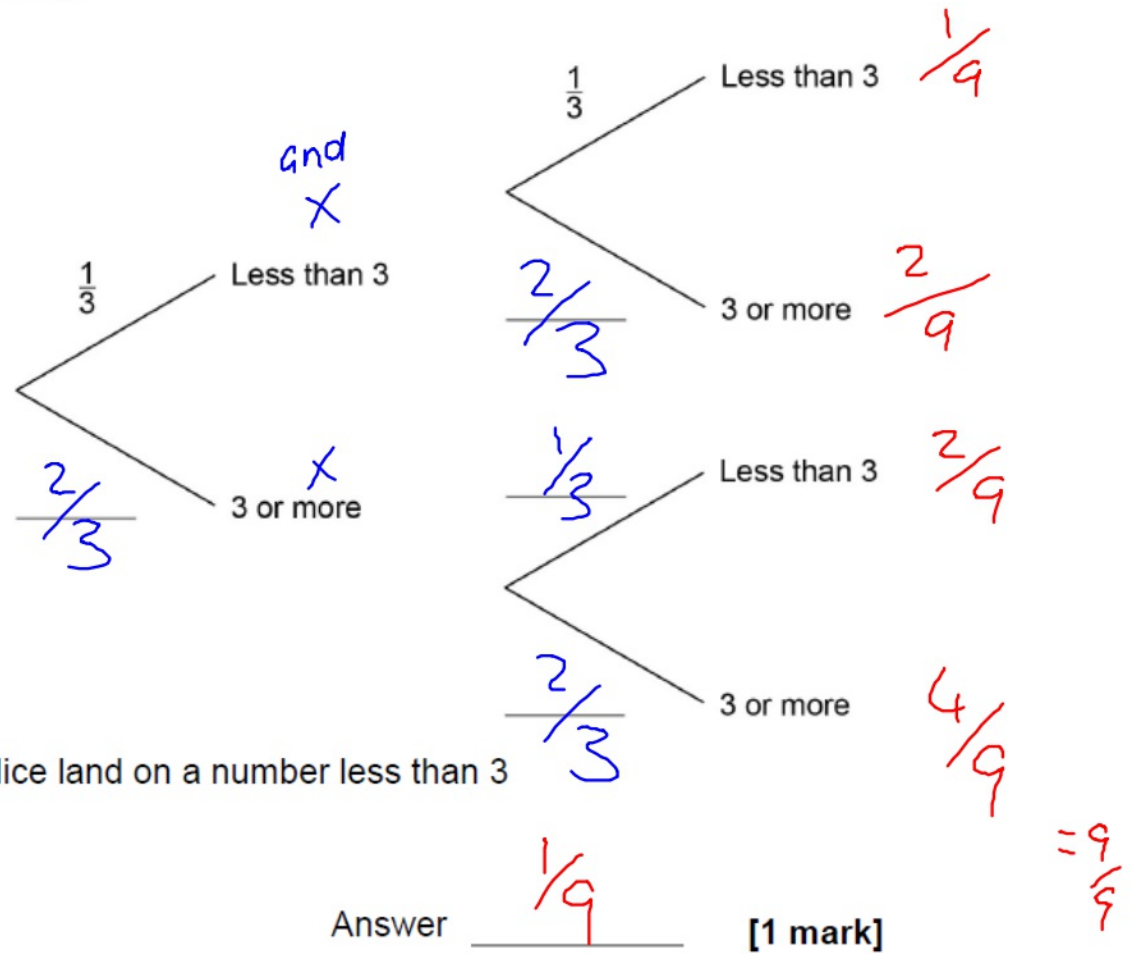
Two ordinary fair dice are rolled.

1st dice

2nd dice

(a) Complete the tree diagram. [1 mark]

P32



(b) Work out the probability that **both** dice land on a number less than 3

**16** A fair spinner has five equal sections numbered 1, 2, 3, 4 and 5

Video created by W Neill

A fair six-sided dice has five red faces and one green face.

The spinner is spun.

If the spinner shows an even number, the dice is thrown.

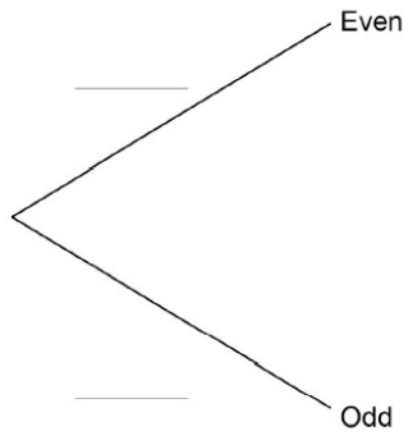
**(a)** Complete the tree diagram for the spinner and the dice. **[2 marks]**

**(b)** Work out the probability of getting an even number and the colour green. **[2 marks]**

P32

Spinner

Dice



Answer \_\_\_\_\_

16 A fair spinner has five equal sections numbered 1, 2, 3, 4 and 5

Video created by W Neill

A fair six-sided dice has five red faces and one green face.

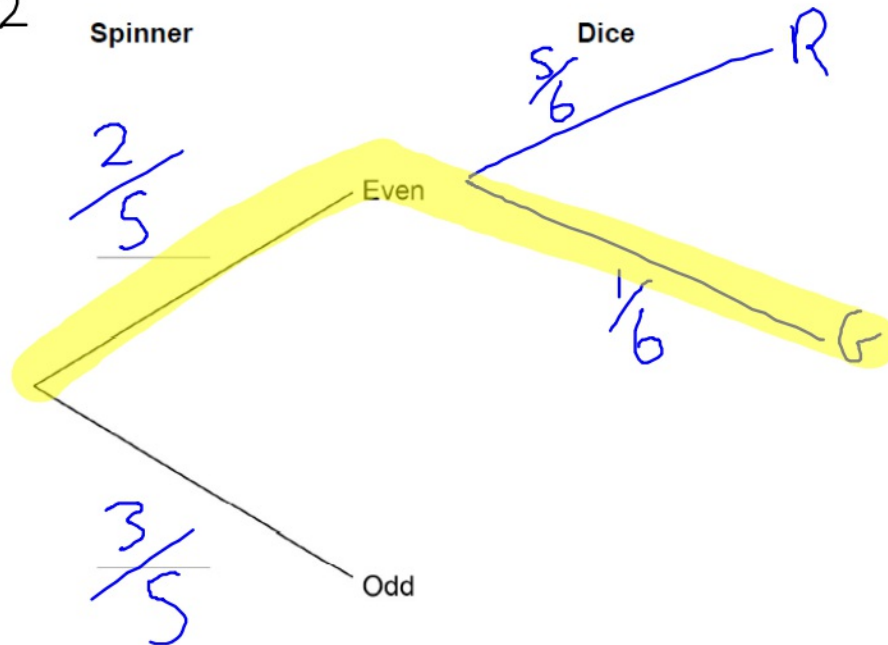
The spinner is spun.

If the spinner shows an even number, the dice is thrown.

(a) Complete the tree diagram for the spinner and the dice. [2 marks]

(b) Work out the probability of getting an even number and the colour green. [2 marks]

P32



b) even and green

$$\frac{2}{5} \times \frac{1}{6}$$
$$= \frac{2}{30} \checkmark$$

Answer \_\_\_\_\_