

# Tree Diagrams

Video 252 on [www.corbettmaths.com](http://www.corbettmaths.com)

Examples



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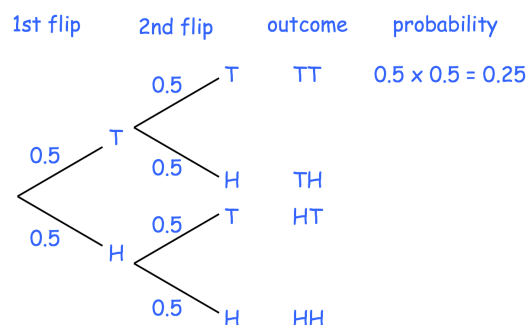


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Workout

Question 1: A fair coin is flipped twice.

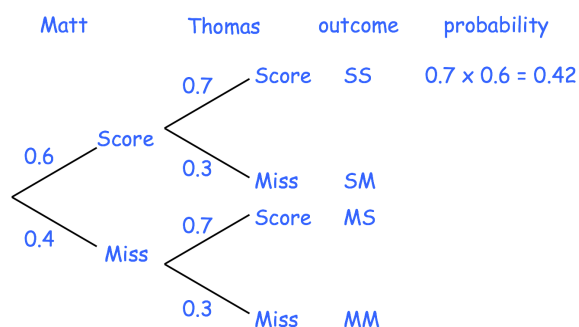
- (a) Copy and complete the tree diagram
- (b) Find the probability of getting two heads
- (c) Find the probability of getting a head and then a tail
- (d) Find the probability of getting at least one head



Question 2: Matt and Thomas each take a penalty.

The probability that Matt scores is 0.6  
The probability that Thomas scores is 0.7

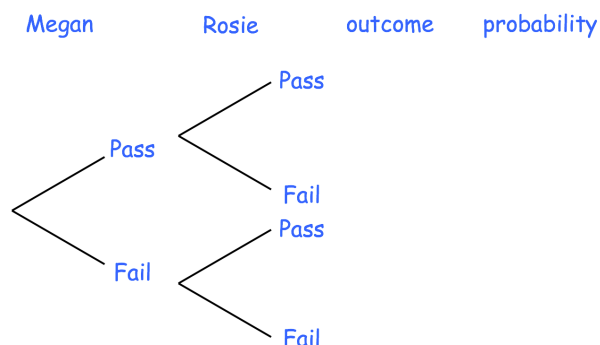
- (a) Copy and complete the tree diagram
- (b) Find the probability of both boys missing
- (c) Find the probability of one boy scoring
- (d) Find the probability of at least one boy missing



Question 3: Megan and Rosie sit their driving tests.

The probability that Megan passes the test is 0.8  
The probability the Rosie fails the test is 0.3

- (a) Copy and complete the tree diagram
- (b) Find the probability that both women pass
- (c) Find the probability that Megan fails and Rosie passes
- (d) Find the probability that at least one woman passes



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Question 4: Harry goes to an arcade. He has one go on the Teddy Grabber and one go on the Penny Drop.

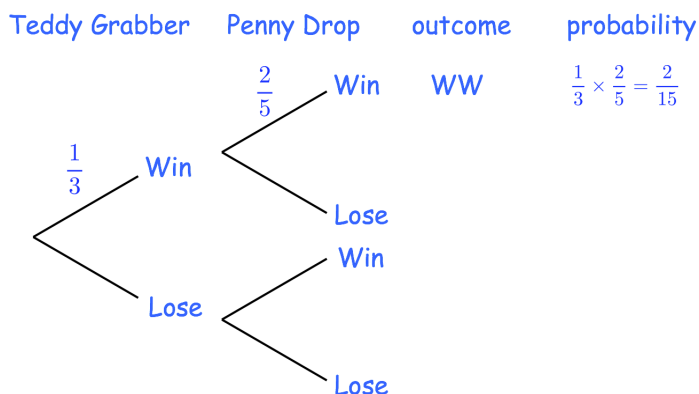
The probability that he wins on the Teddy Grabber is  $\frac{1}{3}$

The probability that he wins on the Penny Drop is  $\frac{2}{5}$

(a) Copy and complete the tree diagram

(b) Work out the probability that Harry loses on the Teddy Grabber and he also loses on the Penny Drop

(c) Work out the probability that Harry wins on exactly one machine



Question 5: There are 5 lemon and 4 strawberry sweets in a bag.

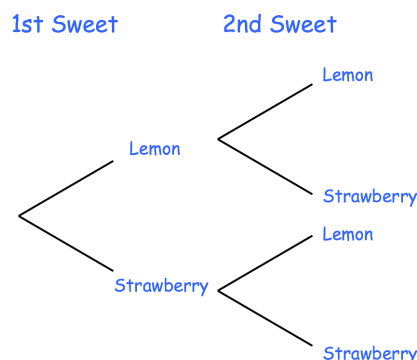
Hailey takes out a sweet at random, writes down its flavour and puts it back into the bag. Then Hailey takes out a second sweet, at random, and writes down its flavour.

(a) Copy and complete the tree diagram

(b) Find the probability of two lemon sweets

(c) Find the probability of one of each flavour

(d) Find the probability of no lemon sweets



Question 6: The probability that a bus arrives late is 0.1

Victor is travelling by bus on Monday and Tuesday.

(a) Show this information on a tree diagram

(b) Calculate the probability that the bus is on time both days.

Question 7: Each morning Martina attempts a crossword and a Sudoku

The probability that Martina successfully completes the crossword is 0.3

The probability that Martina successfully completes the Sudoku is 0.6

(a) Show this information on a tree diagram

(b) Work out the number of days that Martina successfully completes both the crossword and Sudoku over a period of 200 days.

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## Apply

Question 1: Timothy is taking part in an archery competition.

The probability of windy weather is 0.2

If it is windy, the probability of Timothy hitting the target is 0.35  
 If it is not windy, the probability of Timothy hitting the target is 0.8

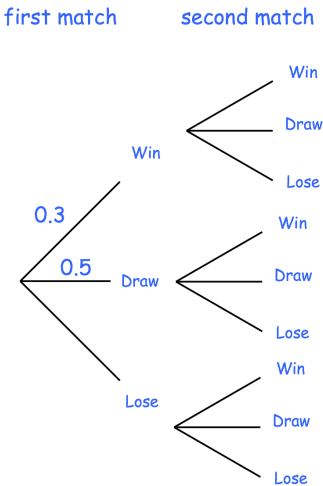
- (a) Draw a tree diagram to show this information
- (b) Find the probability of Timothy hitting the target.

Question 2: A football team has two matches to play.

The probability that the team wins is 0.3  
 The probability that the team draws is 0.5

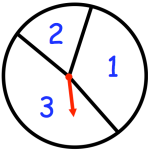
A win is worth 3 points, a draw 1 point and a loss 0 points.

Calculate the probability that the team will score at least 3 points over the two matches.



Question 3: Shown is a spinner.

The probability of a 1 is  $3x$   
 The probability of a 2 is  $x$   
 The probability of a 3 is  $4x$



- (a) Calculate the value of  $x$
- The spinner is spun twice and the scores are multiplied together.
- (b) Work out the probability that the final score is odd.

Question 4: Freddie and Martha have dentist appointments.

The probability that Freddie is on time to his appointment is 0.9  
 The probability that both Freddie and Martha are on time to their appointments is 0.72

- (a) Draw a tree diagram for this information
- (b) Find the probability that both people are late for their appointments

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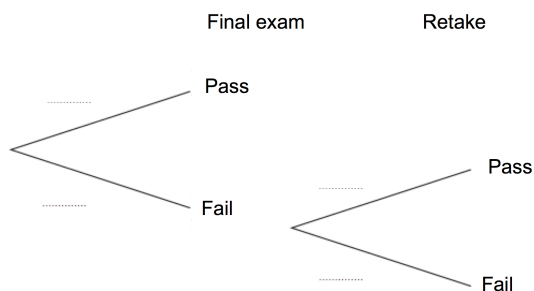
Question 5: A college course consists of 8 weeks of teaching with a final exam at the end of the course

If a student fails the final exam, they have one opportunity to retake the exam.

The probability of a student passing the final exam is  $\frac{7}{8}$

The probability of a student passing the retake is  $\frac{2}{3}$

(a) Complete the tree diagram



If a student passes the final exam or retake, they receive a certificate.

(b) Work out the probability that a student receives a certificate.

Question 6: There are 10 counters in a bag, 7 are green and the rest of white.

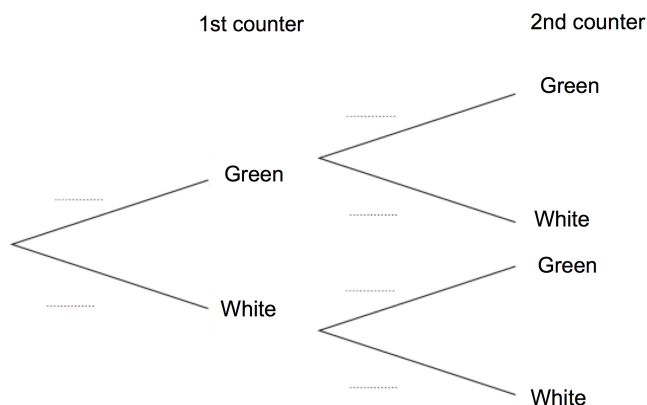
Erin takes out a counter at random and records its colour.

Without replacement, Erin takes out another counter, at random.

(a) Complete the tree diagram

(b) Find the probability that both counters are different colours

(c) Find the probability that both counters are the same colour



Question 7: Jenson is going to choose a ball at random from a bag and then flip a coin.

There are 5 balls in the bag, 2 white and 3 black.

A ball is picked at random from the bag and its colour is recorded.

If the ball is white, a fair coin is flipped.

If the ball is black, a biased coin is flipped, where heads has a probability of  $\frac{7}{8}$

(a) Draw a tree diagram to show this information

Jenson selects a ball and flips the appropriate coin.

(b) Find the probability that he obtains a tail.

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Question 8: There are  $x$  apples in a crate.  
3 of the apples are bad.

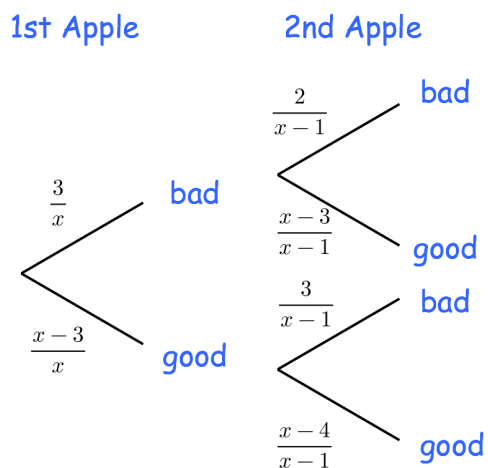
Robert chooses two apples from the crate, without replacement

The probability that he selects two bad apples is  $\frac{1}{12}$

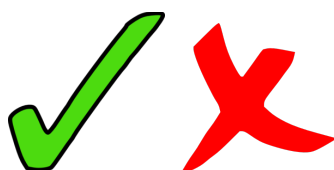
(a) Using the tree diagram, prove  $x^2 - x - 72 = 0$

(b) Find the number of apples in the crate,  $x$ .

(c) Find the probability that both apples are good



Answers



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