



# Probability

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17

	Boys	Girls	Total
Asia	62	28	
Europe	35	45	
Africa		17	
Total			255

For a small international school, the holiday destinations of the 255 students are shown in the table.

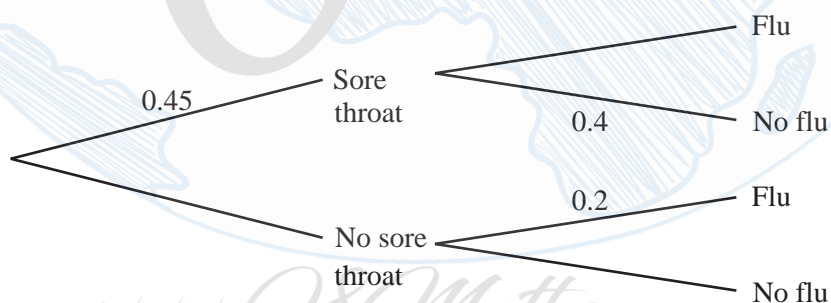
(a) Complete the table. [3]

(b) What is the probability that a student chosen at random is a girl going on holiday to Europe?

Answer(b) ..... [1]

2) November 2011 V1

- 10 In a flu epidemic 45% of people have a sore throat.  
 If a person has a sore throat the probability of **not** having flu is 0.4.  
 If a person does not have a sore throat the probability of having flu is 0.2.



Calculate the probability that a person chosen at random has flu.

Answer ..... [4]

**21 In this question, give all your answers as fractions.**

A box contains 3 red pencils, 2 blue pencils and 4 green pencils.  
Raj chooses 2 pencils at random, without replacement.

Calculate the probability that

(a) they are both red,

*Answer(a)* ..... [2]

(b) they are both the same colour,

*Answer(b)* ..... [3]

(c) exactly one of the two pencils is green.

*Answer(c)* ..... [3]

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4) June 2013 V3

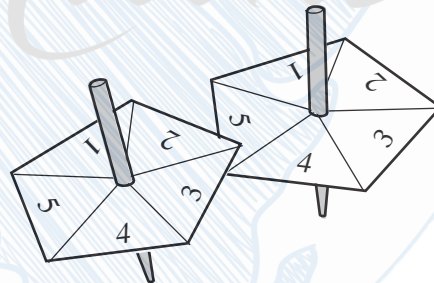
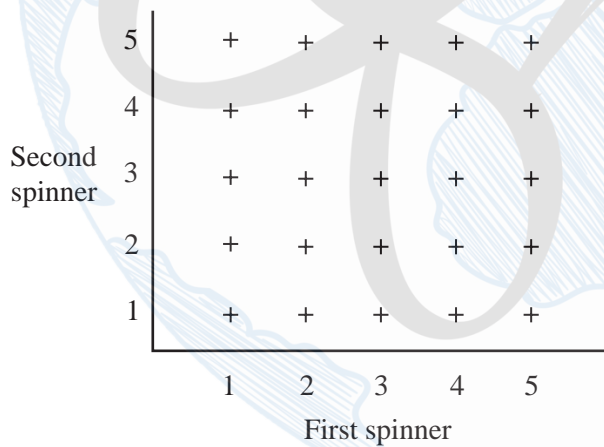
- 2 The Ocean View Hotel has 300 rooms numbered from 100 to 399. A room is chosen at random.

Find the probability that the room number ends in zero.

Answer ..... [2]

5) June 2013 V3

- 12 Two spinners have sections numbered from 1 to 5. Each is spun once and each number is equally likely. The possibility diagram is shown below.



Find the probability that

- (a) both spinners show the same number,

Answer(a) ..... [2]

- (b) the sum of the numbers shown on the two spinners is 7.

Answer(b) ..... [2]



6

S P A C E S

One of the 6 letters is taken at random.

(a) Write down the probability that the letter is S.

Answer(a) ..... [1]

(b) The letter is replaced and again a letter is taken at random.  
This is repeated 600 times.

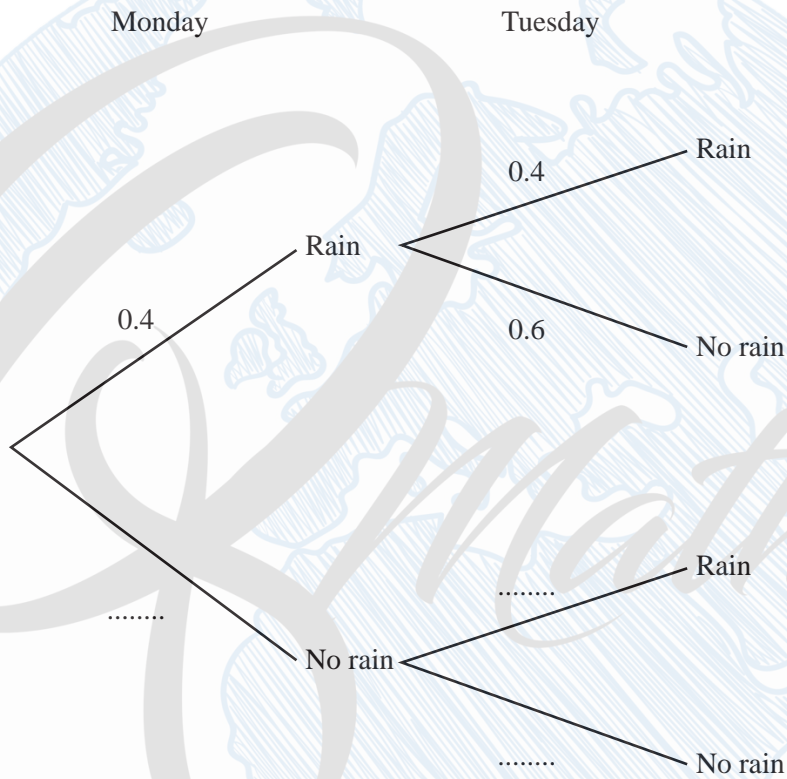
How many times would you expect the letter to be S?

Answer(b) ..... [1]

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- 18** If it rains today the probability that it will rain tomorrow is 0.4 .  
 If it does not rain today the probability that it will rain tomorrow is 0.2 .  
 On Sunday it rained.

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



[2]

- (b) Find the probability that it rains on at least one of the two days shown in the tree diagram.

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Answer(b) ..... [3]

8) June 2015 V1

- 5 Paul and Sammy take part in a race.  
The probability that Paul wins the race is  $\frac{9}{35}$ .  
The probability that Sammy wins the race is 26%.

Who is more likely to win the race?  
Give a reason for your answer.

Answer ..... because ..... [2]

9) June 2015 V2

- 5 A biased 4-sided dice is rolled.  
The possible scores are 1, 2, 3 or 4.  
The probability of rolling a 1, 3 or 4 is shown in the table.

Score	1	2	3	4
Probability	0.15		0.3	0.35

Complete the table.

[2]

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20 The table shows the probability that a person has blue, brown or green eyes.

Eye colour	Blue	Brown	Green
Probability	0.4	0.5	0.1

Use the table to work out the probability that two people, chosen at random,

(a) have blue eyes,

Answer(a) ..... [2]

(b) have different coloured eyes.

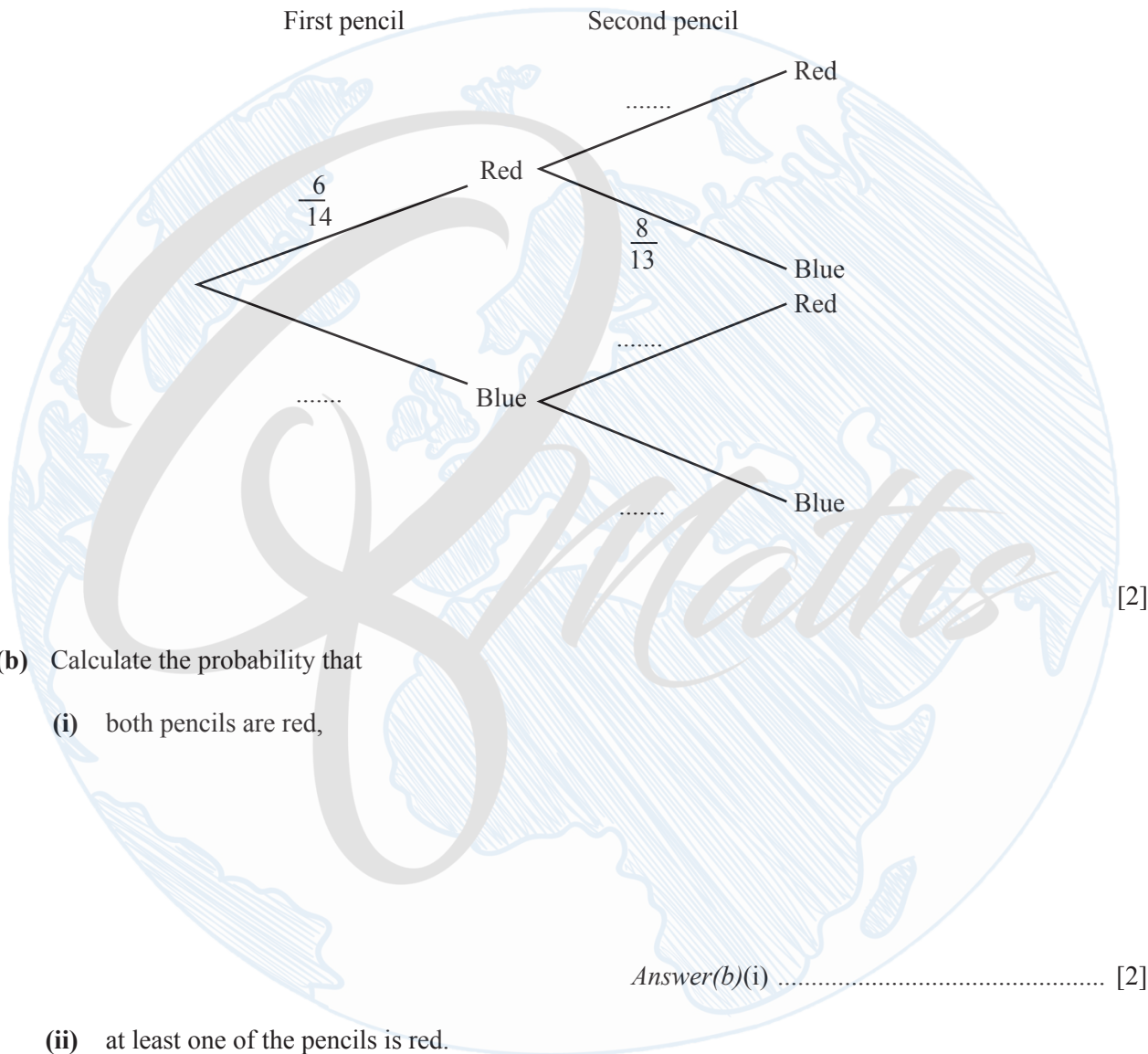
Answer(b) ..... [4]

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- 23 A box contains 6 red pencils and 8 blue pencils.  
 A pencil is chosen at random and not replaced.  
 A second pencil is then chosen at random.

(a) Complete the tree diagram.



(b) Calculate the probability that

(i) both pencils are red,

Answer(b)(i) ..... [2]

(ii) at least one of the pencils is red.

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

12) November 2015 V3

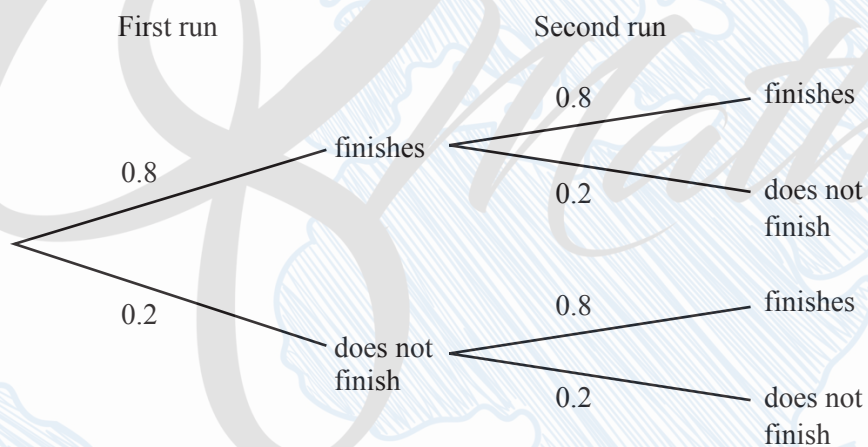
- 4 The probability that it will rain on any day is  $\frac{1}{5}$ .

Calculate an estimate of the number of days it will rain in a month with 30 days.

Answer ..... [1]

13) November 2015 V3

- 18 Samira takes part in two charity runs.  
The probability that she finishes each run is 0.8 .



Find the probability that Samira finishes at least one run.

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Answer ..... [3]

21 Dan either walks or cycles to school.  
The probability that he cycles to school is  $\frac{1}{3}$ .

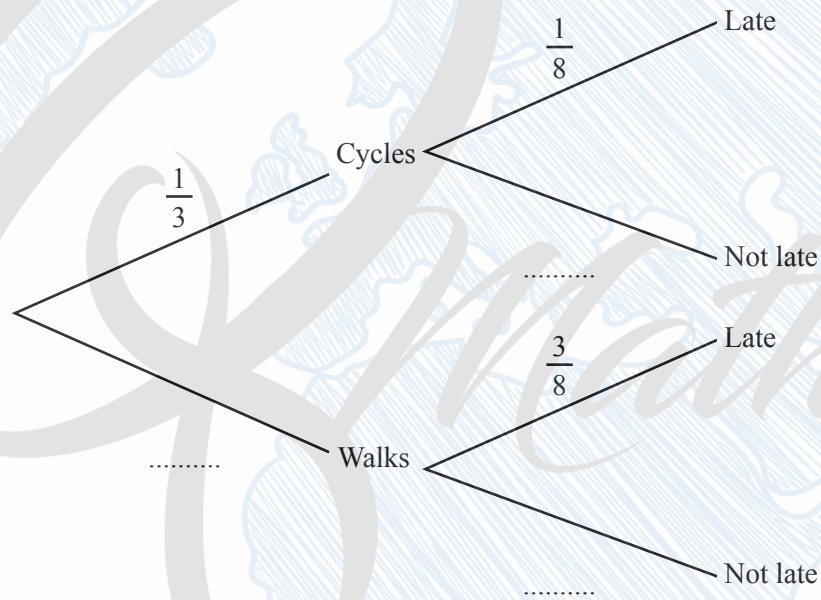
(a) Write down the probability that Dan walks to school.

..... [1]

(b) When Dan cycles to school the probability that he is late is  $\frac{1}{8}$ .

When Dan walks to school the probability that he is late is  $\frac{3}{8}$ .

Complete the tree diagram.



[2]

(c) Calculate the probability that

(i) Dan cycles to school and is late,

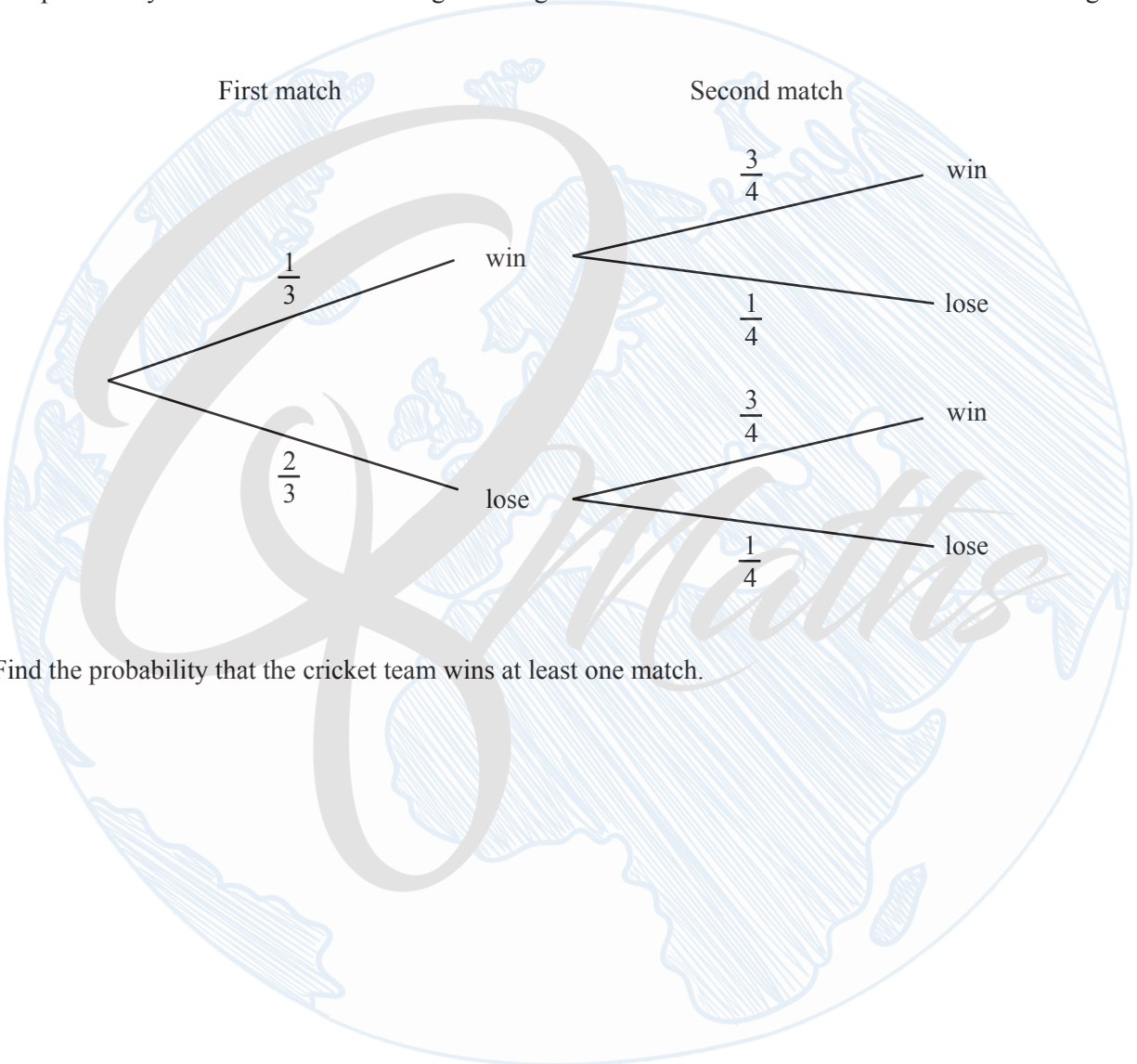
..... [2]

(ii) Dan is not late.

..... [3]



19 The probability of a cricket team winning or losing in their first two matches is shown in the tree diagram.



Find the probability that the cricket team wins at least one match.

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..... [3]



16) June 2016 V3

11 Hattie has a box of coloured pens.  
She takes a pen at random from the box.  
The probability that she takes a red pen is 0.4 .

(a) Work out the probability that she does not take a red pen.

..... [1]

(b) The box contains only blue, red and green pens.  
There are 15 blue pens and 15 green pens.

Complete the table.

Colour of pen	Blue	Red	Green
Number of pens	15		15
Probability		0.4	

[2]

17) June 2017 V1

8 Simon has two boxes of cards.  
In one box, each card has one shape drawn on it that is either a triangle or a square.  
In the other box, each card is coloured either red or blue.

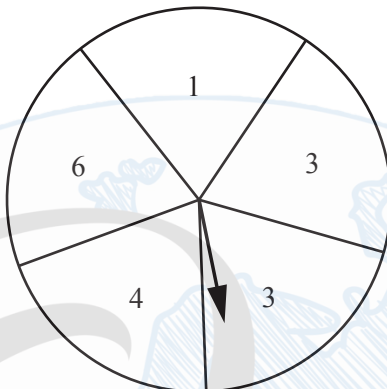
Simon picks a card from each box at random.  
The probability of picking a triangle card is  $t$ .  
The probability of picking a red card is  $r$ .

Complete the table for the cards that Simon picks, writing each probability in terms of  $r$  and  $t$ .

Event	Probability
Triangle and red	
Square and red	$(1 - t)r$
Triangle and blue	
Square and blue	

[3]

20 The diagram shows a fair spinner.



Anna spins it twice and adds the scores.

(a) Complete the table for the total scores.

		Score on first spin				
		1	3	3	4	6
Score on second spin	1	2	4	4	5	7
	3	4	6	6	7	9
	3	4	6	6	7	9
	4					
	6					

[1]

(b) Write down the most likely total score.

..... [1]

(c) Find the probability that Anna scores

(i) a total less than 6,

..... [2]

(ii) a total of 3.

..... [1]

24) June 2017 V3

- 6 The probability that Pedro scores a goal in any match is  $\frac{2}{5}$ .

Calculate the probability that Pedro scores a goal in each of the next two matches.

..... [2]

25) June 2018 V1

- 20 (a) A box contains 3 blue pens, 4 red pens and 8 green pens only.  
A pen is chosen at random from the box.

Find the probability that this pen is green.

..... [1]

- (b) Another box contains 7 black pens and 8 orange pens only.  
Two pens are chosen at random from this box without replacement.

Calculate the probability that at least one orange pen is chosen.

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..... [3]



- 24 Box  $A$  and box  $B$  each contain blue and green pens only.  
Raphael picks a pen at random from box  $A$  and Paulo picks a pen at random from box  $B$ .  
The probability that Raphael picks a blue pen is  $\frac{2}{3}$ .  
The probability that both Raphael and Paulo pick a blue pen is  $\frac{8}{15}$ .

(a) Find the probability that Paulo picks a blue pen.

..... [2]

(b) Find the probability that both Raphael and Paulo pick a green pen.

..... [3]

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