Edexcel B (R)

Statistics and probability

2022 International GCSE Advance Information

Sparx Topics & Key Questions

We are always looking for ways to support maths teachers and students. In order to help you and your year 11s this year we've pulled together a list of key questions which may be useful to practise with your students based on the exam board topic lists.

These 44 key questions are all taken from our library of over 45,000 high-quality questions in Sparx Maths. If you are a Sparx Maths School then your students can use the Topic Codes provided to search the full content library directly within the independent learning section of Sparx Maths to help target their revision.

Please note this is not an exhaustive topic guide it is simply designed to help you pull together some key questions to use to check for understanding in lessons, starters, or as worksheets with your learners.

Statistics and probability	Topics	Sparx Topic Codes
Diagrams	Histogram	B420, B583
	Pie charts	B940, B357
Statistical measures	Mean, median and mode, discrete data	B607, B982
	Grouped data	B855, B964
	Mean	B607, B982
Probability	Expected frequency	B888
	Probability	B685, B591
	Tree diagram	B369, B994
	Conditional probability	B388, B604

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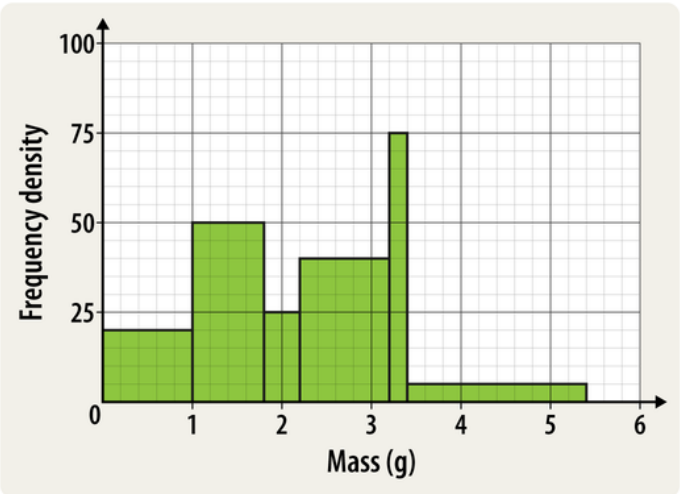
Diagrams - Histogram

Interpreting histograms B420

The histogram below shows information about the masses of gold in the rings in a jewellery shop.

a) Work out an estimate for the number of rings that contain between 1.4 g and 3 g of gold.

b) Write a sentence to explain why the value you calculated in part a) is only an estimate.



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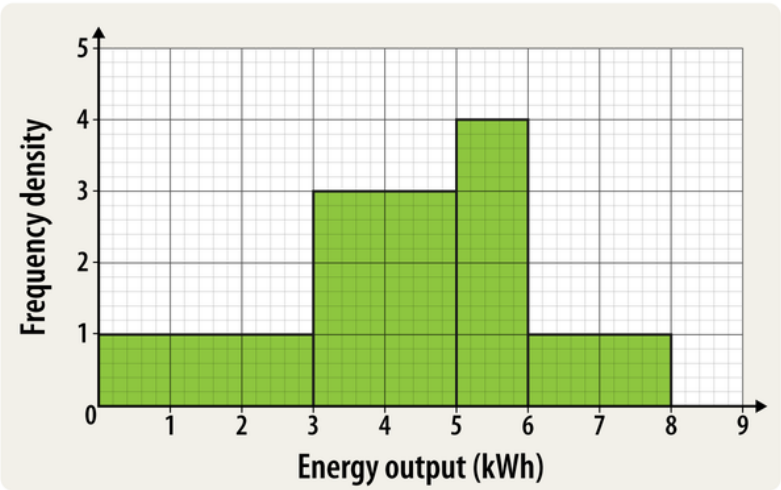
Calculating averages from histograms

B583

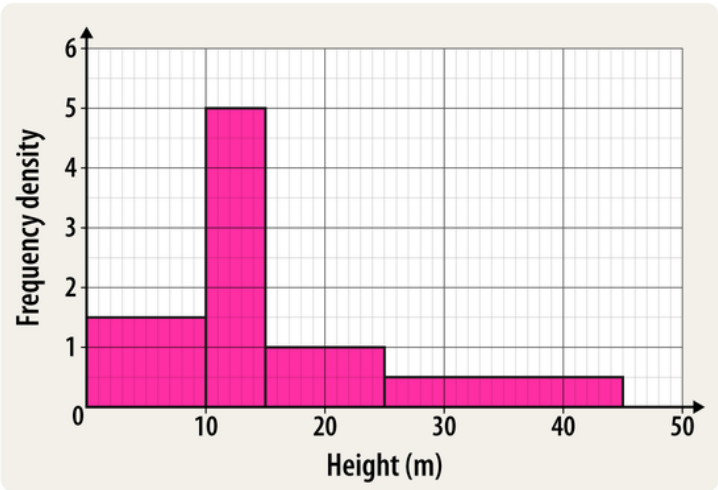
The histogram below shows information about the daily energy output of a solar panel for a number of days.

Calculate an estimate for the mean daily energy output.
If your answer is a decimal, give it to 1 d.p.



The histogram below shows information about the heights of 60 trees in a forest.

Work out an estimate for the median height of these trees.
If your answer is a decimal, give it to 1 d.p.



Diagrams - Pie charts

Drawing pie charts B940

The colour of 30 people`s hair was recorded in a survey, and the results are going to be shown in a pie chart.

Hair colour	Brown	Ginger	Blonde
Frequency	15	9	6

a) Work out the central angle for each sector.

b) Draw a pie chart to show this information.

The shoe sizes of 40 people are recorded in the table below, but one of the frequencies is missing.

Shoe size	Frequency
5	20
6	
7	8

If this information was shown on a pie chart, how many degrees should the central angle of the section that represents **size 6** be?

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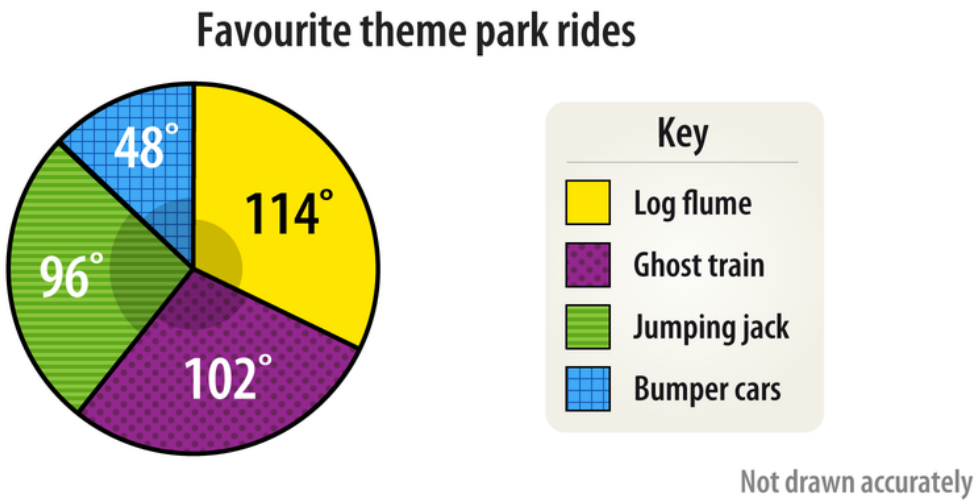
Interpreting pie charts

B357

19 people said that their favourite theme park ride was the **log flume**.

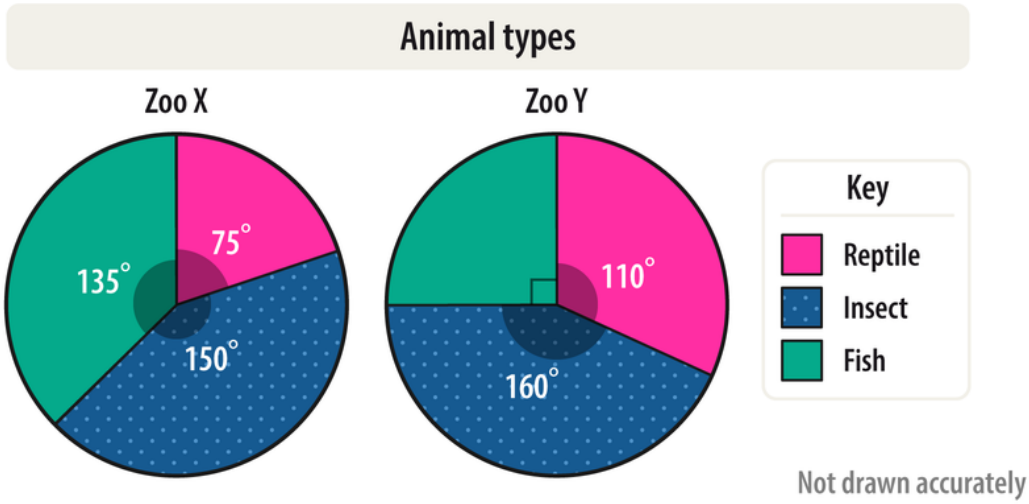
How many people said that their favourite theme park ride was the **ghost train**?



There are a total of 1800 animals in zoo X and 3240 animals in zoo Y.

a) Which zoo has more fish?

b) How many fish are there in this zoo?



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Statistical measures - Mean, median and mode, discrete data

Calculating and choosing suitable averages B607

a) Find the **mode** of the data shown below.

b) Find the **median** of the data shown below.

14, 19, 7, 11, 7, 21, 5, 15, 15, 7

Calculate the mean of the data below.

$12, \quad 9, \quad 0, \quad 6, \quad 13$

A school has exactly 430 senior students and 570 junior students.

The mean height of the senior students is $1.73\,\mathrm{m}$.
The mean height of the junior students is $1.57\,\mathrm{m}$.

What is the mean height of all the students in the school?
Give your answer in metres (m) to 2 d.p.

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Owen has a set of five number cards.

The mean of the cards is 6, the mode is 8, the median is 7 and the range is 5.

Write down the five numbers on Owen`s cards.

Finding averages from frequency tables **B982**

William rolled a dice 25 times and recorded how many times it landed on each number in the frequency table below. What was the modal score?

Score	Frequency
1	4
2	1
3	8
4	3
5	4
6	5

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Harvey asked some of his friends how old they were. His results are shown in the table below.

What was the **median** age?

Age (years)	Frequency
11	2
12	5
13	4
14	3
15	2
16	4

Grace recorded the number of items bought by each customer in a clothes shop over two days. Her results are shown in the table below.

Work out the **mean** number of items bought by each customer.
Give your answer as a decimal.

Items bought	Day: Saturday	Day: Sunday
1	4	6
2	1	5
3	7	2
4	2	3

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Statistical measures - Grouped data

Interpreting frequency tables with grouped data B855

The table below shows information about the distance walked by some hikers.

a) Work out the **minimum** number of hikers who could have walked between 8 miles and 19 miles.

b) Work out the **maximum** number of hikers who could have walked between 8 miles and 19 miles.

Distance, x (miles)	Frequency
$0 \leq x < 5$	3
$5 \leq x < 10$	4
$10 \leq x < 15$	7
$15 \leq x < 20$	6
$20 \leq x < 25$	1

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A total of 400 people live in a village.

50 of these people were chosen at random and their ages were recorded in the table below.

Work out an estimate for the total number of people in the village who are older than 20 but not older than 40.

Age, x (years)	Frequency
$0 < x \leq 20$	7
$20 < x \leq 40$	13
$40 < x \leq 60$	19
$60 < x \leq 80$	8
$80 < x \leq 100$	3

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Finding averages from grouped data **B964**

Jordan measured the mass of each of the elephants at a sanctuary.

Calculate an estimate of the **mean** mass of the elephants at this sanctuary.
Give your answer in tonnes to 1 d.p.

Mass, m (tonnes)	$1 < m \leq 2$	$2 < m \leq 3$	$3 < m \leq 4$
Frequency	6	13	4

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Calculate an estimate of the **mean** mass of the elephants at this sanctuary.
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Mass, m (tonnes)	$1 < m \leq 2$	$2 < m \leq 3$	$3 < m \leq 4$
Frequency	6	13	4

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The table below shows how much time some people spent exercising yesterday.

a) What is the **modal class** of time spent exercising?

b) In which class does the **median** lie?

Time spent, x (minutes)	Frequency
$0 < x \leq 10$	8
$10 < x \leq 20$	23
$20 < x \leq 30$	11
$30 < x \leq 40$	9
$40 < x \leq 50$	13
$50 < x \leq 60$	15

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Statistical measures - Mean

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Calculate the mean of the data below.

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4	3
5	4
6	5

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Items bought	Day: Saturday	Day: Sunday
1	4	6
2	1	5
3	7	2
4	2	3

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Probability - Expected frequency

Expected results from repeated experiments B888

A cafeteria has four different meal options: salad, curry, burger and stew. Each customer eats one type of meal.
The probabilities of a customer chosen at random eating each type of meal are shown in the table below.

Yesterday, Henry chose 400 customers at random and asked them which meal they ate that day.
How many of these customers would you expect to have eaten **stew**?

Meal	Probability
Salad	0.1
Curry	$\frac{3}{10}$
Burger	25%
Stew	?

Neave is designing a prize wheel for her school. 200 students will spin the wheel once each.
Neave wants the expected number of winners to be 60.

If the wheel is split into 40 equal-sized sections, how many of the sections should be marked as "win"?

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Probability - Probability

Probabilities of mutually exclusive events B685

A bag contains marbles that are either yellow, white or red.

If a marble is chosen from the bag at random, $P(\text{yellow}) = 34\%$ and $P(\text{red}) = 15\%$.

a) Decide whether picking a yellow marble and picking a red marble from the bag are **mutually exclusive** events. Write a sentence to explain your answer.

b) Write a sentence to explain whether it is possible to work out $P(\text{yellow or red})$. If it is possible, then work out this probability, giving your answer as a percentage.

Paige has some cards. Each card has a colour on it.

If she chooses a card at random, then $P(\text{blue}) = \frac{5}{9}$ and $P(\text{white}) = \frac{1}{18}$.

Calculate $P(\text{neither blue nor white})$.
Give your answer as a fraction in its simplest form.

Experimental probabilities B591

Aiden had a six-sided dice numbered from 1 to 6. He rolled it 120 times.

a) If the dice were **fair**, how many times would you expect it to have landed on 3?

b) Aiden recorded that the dice landed on 3 a total of 19 times. Is the dice definitely biased or definitely not biased, or is it impossible to tell? Write a sentence to explain your answer.

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Edward spun a prize wheel 700 times. The estimated probability of him winning was 0.42.

He then spun the prize wheel 100 more times and won a further 58 times.

Using the results from all 800 spins, calculate the estimated probability of Edward winning.
Give your answer as a decimal.

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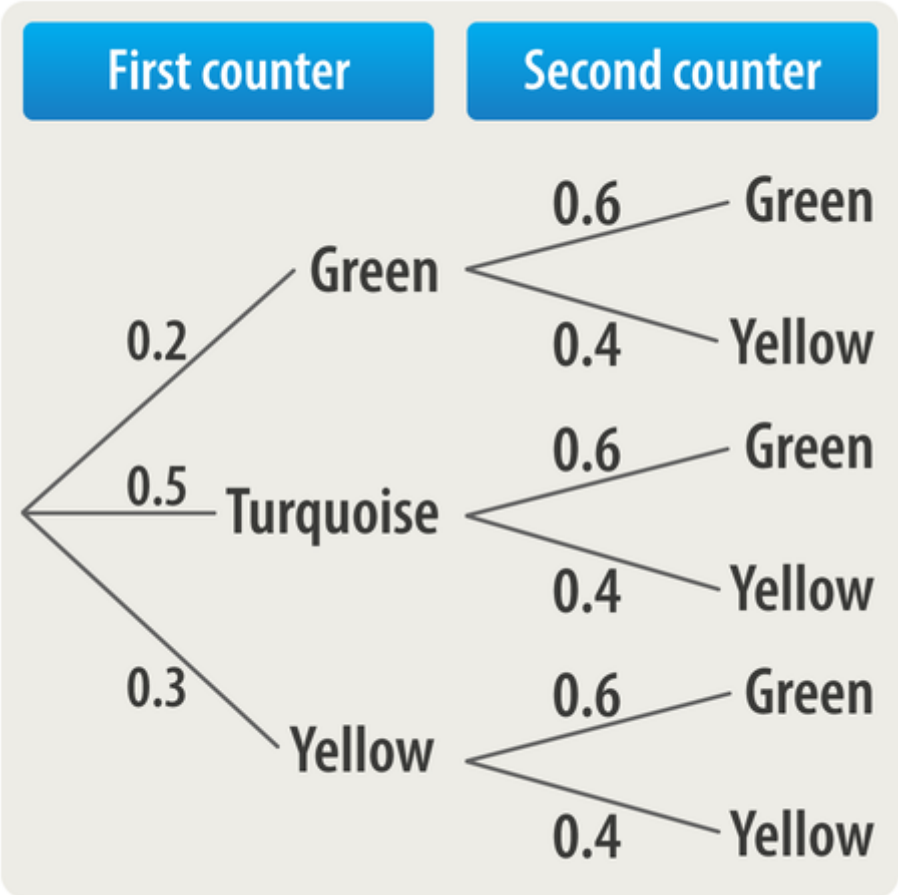
Probability - Tree diagram

Tree diagrams for independent events B369

Daniel has two different bags of coloured counters. He chooses a counter at random from each bag.

Work out the probability of choosing a **yellow counter and then a green counter**.
Give your answer as a decimal.



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A bag has 7 green counters, 1 red counter and 2 blue counters.

A counter is picked at random, returned, and then another counter is picked at random.

What is the probability that the counters chosen are the **same** colour?
Give your answer as a fraction in its simplest form.

Katie has two packs of stickers.
In pack A, there are 8 gold stickers and 2 pink stickers.
In pack B, there are 3 gold stickers and 9 pink stickers.
Katie is going to take one sticker at random from each pack.

What is the probability that she takes one gold and one pink sticker?
Give your answer as a fraction in its simplest form.

Tree diagrams for dependent events **B994**

If it snows on a given day, the probability that it snows the next day is $\frac{7}{10}$.
If it does not snow on a given day, the probability that it snows the next day is $\frac{2}{10}$.

It is snowing today. By first drawing a tree diagram, work out the probability that it will snow on **exactly one** of the next two days.
Give your answer as a fraction in its simplest form.

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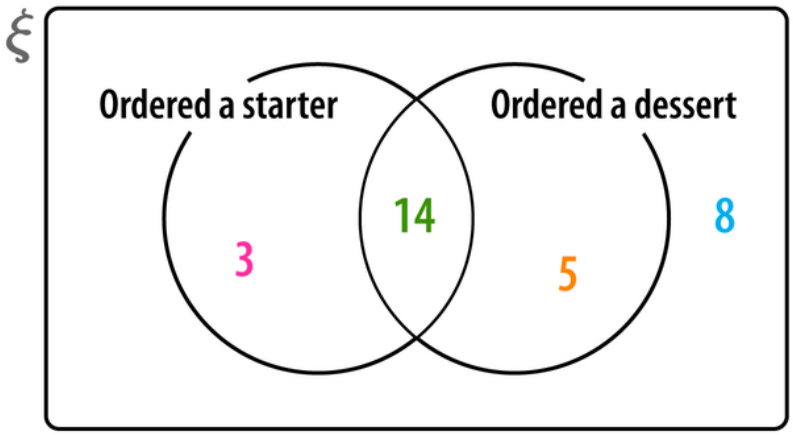
Probability - Conditional probability

Conditional probabilities from Venn diagrams B388

The Venn diagram below shows the number of customers in a restaurant who ordered a starter or a dessert.

A customer is picked at random.

If they ordered a dessert, what is the probability that they did **not** order a starter?
Give your answer as a fraction in its simplest form.



The sets L and M are defined below.

$$\mathrm{L} = \{1, 3, 7, 8\}$$
$$\mathrm{M} = \{2, 3, 5, 7, 8\}$$

a) Draw a Venn diagram to show these sets.

b) Work out the probability that a number chosen at random is in set L, given it is in set M.
Give your answer as a fraction in its simplest form.

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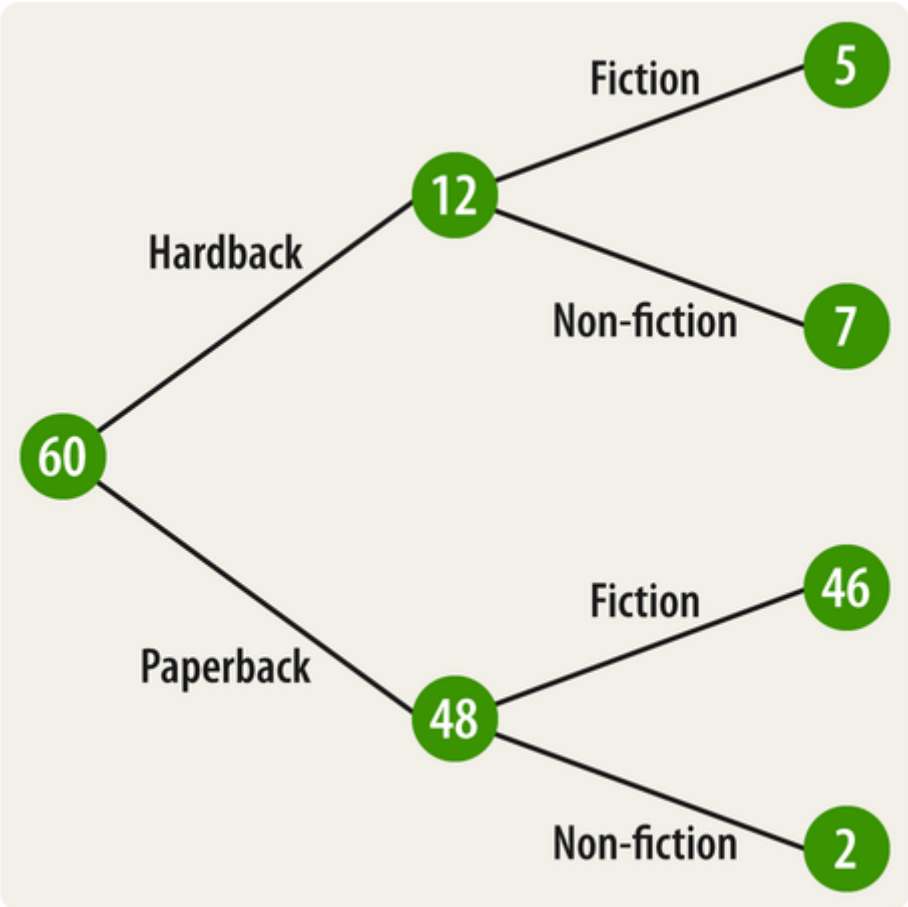
Conditional probabilities from tree diagrams **B604**

The frequency tree below shows information about the books on Poppy`s bookshelf. Poppy`s little brother chose one of these books at random.

Given that the book Poppy`s brother chose was **not** a paperback, what is the probability that it was non-fiction?
Give your answer as a fraction in its simplest form.



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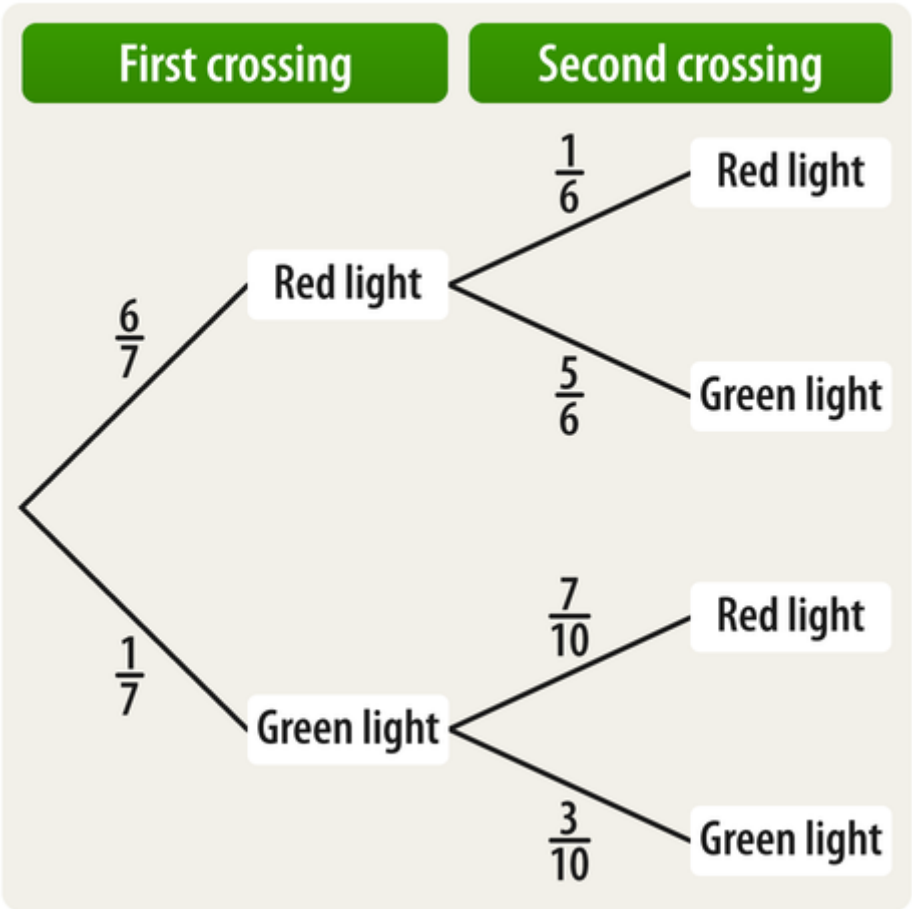
Dale crosses two pedestrian crossings on his way to school, each of which shows either a green or a red light when he arrives.

On one day, the lights at both crossings showed the same colour when Dale arrived.
What is the probability that they both showed red?
Give your answer as a fraction in its simplest form.



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