Guidance for tutors

Outcome	P2	Student can consistently:	Use probabilities in a table to solve problems.

How the topic is examined	• Examined through test paper questions. • Questions are equally likely to appear on calculator and non-calculator papers. • A set of outcomes will be presented in the form of a table along an associated probability. One or more the probabilities may be missing from the table. • Questions can ask students to work out a required probability, find a missing value or work out an expectation based on a number of trials.

Prior knowledge	• Students should be confident with:
	  ○ Basic probability
	  ○ Solving basic equations (AEq1)
	  ○ Adding and subtracting fractions (NF1)
	• In addition questions involving this topic can have links to:
	  ○ Relative frequency (P4)
	  ○ AND/OR rules (P5)
	  ○ Percentages (NR3)

Suggested tuition approaches	• Sometimes probabilities of the outcomes of an event are summarised in the form of a table.
	• The outcomes listed are exhaustive, which means that all of the possible outcomes are listed. In addition all the outcomes are mutually exclusive – in other words no two of them can happen at the same time.
	• If data is presented in a table like this; the sum of the probabilities must be 1 as the total probability is equal to 1. Probabilities are usually presented as decimals, but they could be given as fractions or percentages.
	• Questions that students could be asked on this topic are:
	  ○ Find any missing probabilities.
	  ○ Find a required probability using AND/OR rules.
	  ○ Find an expected number of outcomes given a number of trials.
	• Expected number of outcomes is calculated by multiplying the number of trials by the probability of the outcome.

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A spinner has four coloured sections.
The table below shows the probability of each section

Colour	blue	red	pink	green
Probability	0.3	0.23	0.35	

Some possible questions:

1. **Find the probability of getting green.**

   The total probability is 1, therefore
   P(green) = 1 – (0.3 + 0.23 + 0.35) = 0.12

2. **Find the probability of getting red or pink.**

   P(red or pink) = 0.23 + 0.35 = 0.58
   Using the OR rule of probability you add.

3. **The spinner is spun 200 times. How many times do you expect to get blue?**

   Expectation = number of trials x probability

   = 200 x 0.3 = 60

Common errors and misconceptions

- Students add probabilities incorrectly; (e.g. 0.3 + 0.23 = 0.26 is a common wrong answer – students forget that 0.3 is equal to 0.30). Encourage students to use a calculator if they have one to check.
- When probabilities are given as fractions students can struggle.
- Calculating the expected number of outcomes can cause issues without a calculator. Students might want to convert the probability to a percentage first.

Suggested resources

- Questions
  - http://www.cimt.org.uk/projects/mepres/allgcse/bka5.pdf (pp 168 -175)
  - https://corbettmaths.files.wordpress.com/2013/02/relative-frequency-pdf.pdf
- Video tutorial

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	○ http://corbettmaths.com/2013/06/20/relative-frequency/ • Past GCSE Questions ○ https://keshgcsemaths.files.wordpress.com/2013/11/78_probability-and-relative-frequency2.pdf