

## Guidance for tutors

Outcome	P6	Student can consistently:	Use probability tree diagrams.
How the topic is examined	<ul style="list-style-type: none"> <li>• Examined through test paper questions.</li> <li>• This topic is equally likely to appear on calculator and non-calculator papers.</li> <li>• Tree diagrams can be used for most probability events. They can be used for independent and dependent events.</li> <li>• They can be used to calculate conditional probabilities.</li> </ul>		
Prior knowledge	<ul style="list-style-type: none"> <li>• Students should be confident with: <ul style="list-style-type: none"> <li>◦ Basic probability</li> <li>◦ Four rules with fractions (NF1)</li> </ul> </li> <li>• In addition questions involving this topic can have links to: <ul style="list-style-type: none"> <li>◦ All other probability sections (P1 – P7)</li> </ul> </li> </ul>		
Suggested tuition approaches	<ul style="list-style-type: none"> <li>• Tree diagrams are a great way of representing probability situations visually. They have a whole host of uses.</li> <li>• Tree diagrams are made up of a series of branches.</li> <li>• The number of branches corresponds to the number of outcomes for the event.</li> <li>• We write the outcomes at the end of each branch and we write the probability on the branch.</li> <li>• At GCSE probabilities are usually given as fractions or decimals. Fractions make calculations easier to deal with on non-calculator exams.</li> <li>• Probability tree diagrams can be used for independent and dependent events.</li> <li>• We multiply probabilities across the tree diagram (think of it like the AND rule) and we add probabilities downwards.</li> <li>• Some students write down all the possible outcomes at the end of the branches and work out every probability. They then check that their answers add up to 1.</li> <li>• Questions often talk about removing objects or choosing objects. If the word replacement is used then the object is placed back and events are independent (probabilities remain the same). If the word replacing is not used, assume that the object is NOT replaced and therefore the probabilities of the subsequent events will depend on what was chosen at first.</li> <li>• If a questions says that two 'things' are chosen/removed you need to think of this as removing one 'thing' and then the other. Students sometimes try to draw a tree diagram where you remove two things straight away – this is not possible.</li> </ul>		



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	<div><div>Puzzle</div><div>Assault Course</div><pre>graph LR; P1(( )) --- 0.8  P2[Pass]; P1 --- 0.2  F1[Fail]; P2 --- 0.7  P3[Pass]; P2 --- 0.3  F2[Fail]; F1 --- 0.7  P4[Pass]; F1 --- 0.3  F3[Fail];</pre></div>	
Common errors and misconceptions	<ul style="list-style-type: none"><li>• Students draw all the outcomes from the first set of branches.</li><li>• When the question says that two ‘things’ are removed they think of it as removing both at the same time, whereas you should encourage them to think about it as removing one after the other.</li><li>• Students struggle to multiply fractions and decimals correctly.</li><li>• Avoid simplifying answers until the very final answer, this will make adding fractions together much easier.</li></ul>	
Suggested resources	<ul style="list-style-type: none"><li>• Questions<ul style="list-style-type: none"><li>◦ <a href="http://www.cimt.org.uk/projects/mepres/allgcse/bka5.pdf">http://www.cimt.org.uk/projects/mepres/allgcse/bka5.pdf</a> (pp 182 - 189)</li><li>◦ <a href="https://corbettmaths.files.wordpress.com/2013/02/tree-diagrams-pdf.pdf">https://corbettmaths.files.wordpress.com/2013/02/tree-diagrams-pdf.pdf</a></li></ul></li><li>• Past GCSE Questions<ul style="list-style-type: none"><li>◦ <a href="https://keshgcsemaths.files.wordpress.com/2013/11/92_tree-diagrams.pdf">https://keshgcsemaths.files.wordpress.com/2013/11/92_tree-diagrams.pdf</a></li></ul></li><li>• Video tutorial<ul style="list-style-type: none"><li>◦ <a href="http://corbettmaths.com/2013/05/07/tree-diagrams/">http://corbettmaths.com/2013/05/07/tree-diagrams/</a></li></ul></li></ul>	