

# Fill in the Blanks

# Tree Diagrams for Independent Events

Question	Tree Diagram	Probability	
<p>Two students, Maria and Maysoon each sit their driving theory exam. Complete the tree diagram and calculate the probability of each outcome.</p>	<p><b>Tree Diagram:</b></p> <ul style="list-style-type: none"> <li>From Maria's <b>Pass</b> (0.4): <ul style="list-style-type: none"> <li>Maysoon <b>Pass</b> (0.4)</li> <li>Maysoon <b>Fail</b> (0.6)</li> </ul> </li> <li>From Maria's <b>Fail</b> (0.6): <ul style="list-style-type: none"> <li>Maysoon <b>Pass</b> (0.4)</li> <li>Maysoon <b>Fail</b> (0.6)</li> </ul> </li> </ul>	$P(PP) = 0.4 \times 0.4 =$	<b>0.16</b>
		$P(PF) = 0.4 \times 0.6 =$	<b>0.24</b>
		$P(FP) = 0.6 \times 0.4 =$	<b>0.24</b>
		$P(FF) = 0.6 \times 0.6 =$	<b>0.36</b>
<p>A biased coin is tossed once and then tossed again for a second time. Complete the tree diagram and calculate the probability of each outcome.</p>	<p><b>Tree Diagram:</b></p> <ul style="list-style-type: none"> <li>From <b>First</b> <b>Heads</b> (0.2): <ul style="list-style-type: none"> <li><b>Second</b> <b>Head</b> (0.2)</li> <li><b>Second</b> <b>Tails</b> (0.8)</li> </ul> </li> <li>From <b>First</b> <b>Tails</b> (0.8): <ul style="list-style-type: none"> <li><b>Second</b> <b>Heads</b> (0.2)</li> <li><b>Second</b> <b>Tails</b> (0.8)</li> </ul> </li> </ul>	$P(HH) = 0.2 \times 0.2 =$	<b>0.04</b>
		$P(HT) = 0.2 \times 0.8 =$	<b>0.16</b>
		$P(TH) = 0.8 \times 0.2 =$	<b>0.16</b>
		$P(TT) = 0.8 \times 0.8 =$	<b>0.64</b>
<p>A car travels through two sets of traffic lights. The probability of stopping at each set is the same. Complete the tree diagram and calculate the probability of each outcome.</p>	<p><b>Tree Diagram:</b></p> <ul style="list-style-type: none"> <li>From <b>1st Set</b> <b>Stop</b> (<math>\frac{3}{7}</math>): <ul style="list-style-type: none"> <li><b>2nd Set</b> <b>Stop</b> (<math>\frac{3}{7}</math>)</li> <li><b>2nd Set</b> <b>Go</b> (<math>\frac{4}{7}</math>)</li> </ul> </li> <li>From <b>1st Set</b> <b>Go</b> (<math>\frac{4}{7}</math>): <ul style="list-style-type: none"> <li><b>2nd Set</b> <b>Stop</b> (<math>\frac{3}{7}</math>)</li> <li><b>2nd Set</b> <b>Go</b> (<math>\frac{4}{7}</math>)</li> </ul> </li> </ul>	$P(SS) = \frac{3}{7} \times \frac{3}{7} =$	<b><math>\frac{9}{49}</math></b>
		$P(SG) = \frac{3}{7} \times \frac{4}{7} =$	<b><math>\frac{12}{49}</math></b>
		$P(GS) = \frac{4}{7} \times \frac{3}{7} =$	<b><math>\frac{12}{49}</math></b>
		$P(GG) = \frac{4}{7} \times \frac{4}{7} =$	<b><math>\frac{16}{49}</math></b>
<p>There are 12 red or blue balls in a box. There are more blue balls than red balls. A ball is removed at random, the colour recorded, then replaced. A second ball is then removed. Complete the tree diagram and probabilities.</p>	<p><b>Tree Diagram:</b></p> <ul style="list-style-type: none"> <li>From <b>1st Ball</b> <b>Red</b> (<math>\frac{5}{12}</math>): <ul style="list-style-type: none"> <li><b>2nd Ball</b> <b>Red</b> (<math>\frac{5}{12}</math>)</li> <li><b>2nd Ball</b> <b>Blue</b> (<math>\frac{7}{12}</math>)</li> </ul> </li> <li>From <b>1st Ball</b> <b>Blue</b> (<math>\frac{7}{12}</math>): <ul style="list-style-type: none"> <li><b>2nd Ball</b> <b>Red</b> (<math>\frac{5}{12}</math>)</li> <li><b>2nd Ball</b> <b>Blue</b> (<math>\frac{7}{12}</math>)</li> </ul> </li> </ul>	$P(RR) = \frac{5}{12} \times \frac{5}{12} =$	<b><math>\frac{25}{144}</math></b>
		$P(RB) = \frac{5}{12} \times \frac{7}{12} =$	<b><math>\frac{35}{144}</math></b>
		$P(BR) = \frac{7}{12} \times \frac{5}{12} =$	<b><math>\frac{35}{144}</math></b>
		$P(BB) = \frac{7}{12} \times \frac{7}{12} =$	<b><math>\frac{49}{144}</math></b>