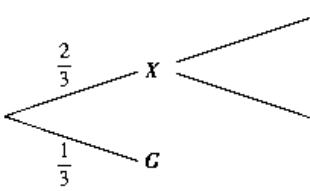


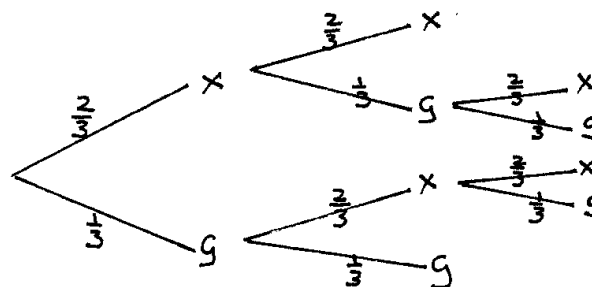
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08	7c	<p>Xena and Gabrielle compete in a series of games. The series finishes when one player has won two games. In any game, the probability that Xena wins is $\frac{2}{3}$ and the probability that Gabrielle wins is $\frac{1}{3}$.</p> <p>(i) Copy and complete the tree diagram.</p> <p>(ii) What is the probability that Gabrielle wins the series?</p> <p>(iii) What is the probability that three games are played in the series?</p>	<p>First game Second game Third game</p> 	
				<p>1</p> <p>2</p> <p>2</p>

i. see diagram

ii. Prob Gabrielle wins

$$\begin{aligned}
 &= P(XGG) + P(GXG) + P(GG) \\
 &= \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3} + \frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} + \frac{1}{3} \times \frac{1}{3} \\
 &= \frac{7}{27}
 \end{aligned}$$



iii. Prob 3 games played

$$\begin{aligned}
 &= P(XGX) + P(XGG) + P(GXX) + P(GXG) \\
 &= \frac{2}{3} \times \frac{1}{3} \times \frac{2}{3} + \frac{1}{3} \times \frac{2}{3} \times \frac{2}{3} \\
 &\quad + \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3} + \frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} \\
 &= \frac{12}{27} \\
 &= \frac{4}{9}
 \end{aligned}$$

* These solutions have been provided by *projectmaths* and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

- A common error occurred when candidates did not read this part carefully and presented a tree diagram with eight outcomes. Outcomes that cannot occur should not be drawn.
- Typical responses applied the laws of probability and made some progress. The better responses stated the correct outcomes and their probabilities. Candidates are encouraged to show all working.
- There were many different methods of answering this part. Responses that identified an appropriate complementary event were awarded a mark. A significant number of responses contained simple calculation errors. Candidates are reminded to state the outcomes and their probabilities.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/