# Probability Worksheet (Tree Diagrams)

1. Imagine that a family of three (Alice, Bill, and Chester) plays bingo at home every night. Each night, the chance that any one of the three players will win is $\frac{1}{3}$.

a) Using A for Alice wins, B for Bill wins, and C for Chester wins, develop a tree diagram that shows the nine possible outcomes for two consecutive nights of play.

b) Is the probability that "Bill wins both nights" the same as the probability that "Alice wins the first night and Chester wins the second night"? Explain.

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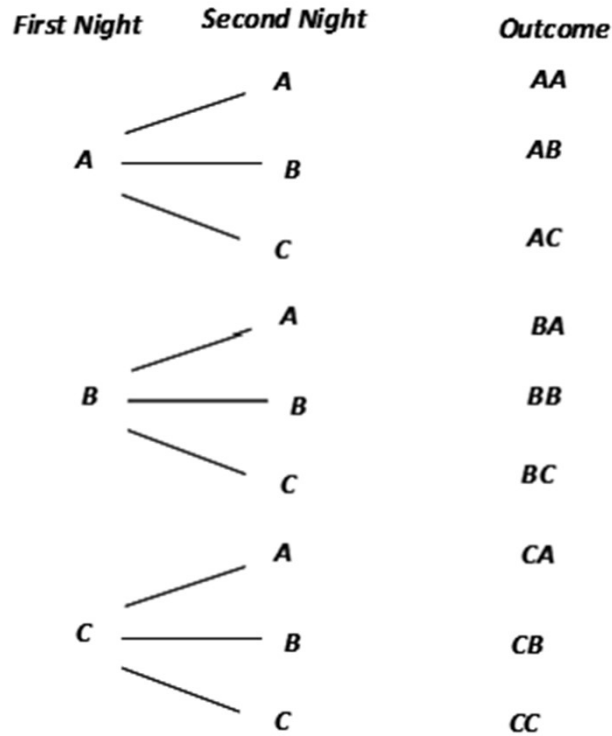
b) Is the probability that "Bill wins both nights" the same as the probability that "Alice wins the first night and Chester wins the second night"? Explain.

Yes. The probability of Bill winning both nights is $\frac{1}{3} \cdot \frac{1}{3} = \frac{1}{9}$, which is the same as the probability of Alice winning the first night and Chester winning the second night $\left(\frac{1}{3} \cdot \frac{1}{3} = \frac{1}{9}\right)$.