# M - Probability

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| **What is the Bayes’ Theorem for conditional probability?** | *In other words, P (one event occurs | another occured) = P (both occurred) / P (given one occurred)* ***OR*** *the probability of one event occurring given another has already occured.* |
| **How can you check if event A depends on event B?** | **If dependent:**    As given B has occurred, then the probability of A changes.  **Otherwise, if independent:**    As B occurring doesn’t affect the probability of A occurring, |
| **Give an example of a dependent event** | Picking sweets out of a bag **without replacement**. |
| **What product-based formula holds true if event A and event B are independent? Why?** | This is because…    As they’re independent. Finally, you can rearrange. |
| **What are mutually exclusive events? (with example and formula)** | Events that cannot occur at the same time. E.g.,    Or flipping a coin **TWICE**, you cannot have HH and TT at the same time meaning these events are also mutually exclusive. This can be given by: |
| **What is the probability of event A OR event B?** | For mutually exclusive, P(A n B) = 0. |
| **What are exhaustive events? (with example)** | When rolling a six-sided die, the events 1, 2, 3, 4, 5, and 6 are collectively exhaustive, because they encompass the entire range of possible outcomes |
| **What are complementary events? (with example)** | Two outcomes of an event that are the **only two possible outcomes**. E.g., heads and tails of a coin.  *This is a type of mutually exclusive events.* |