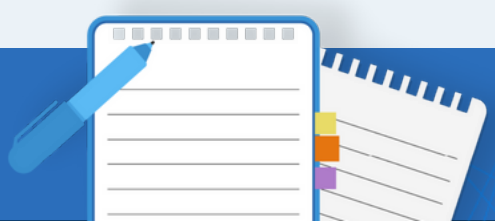
KEY TAKEAWAYS

CHAPTER TITLE | **Probability Theory**

LECTURE TITLE | **Probability Basics**

1. **Probability** is a measure of the chance of an **event happening**. It ranges from **0 (impossible)** to **1 (certain).**

2. It's calculated by dividing **favorable** outcomes by **possible outcomes**.



KEY TAKEAWAYS

CHAPTER TITLE | **Probability Theory**

LECTURE TITLE | **Addition and Multiplication Rule**

1 Addition Rule:

Non-overlapping Events: $p(E \cup F) = p(E) + p(F)$ where event E and F don't overlap.

Overlapping Events: $p(E \cup F) = p(E) + p(F) - p(E \cap F)$

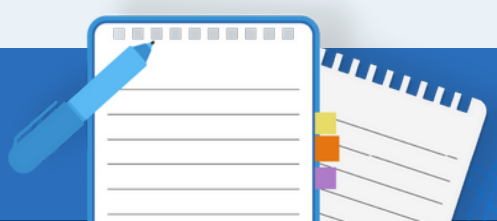
2 Multiplication Rule:

Independent Events ("And" Rule): $p(E \cap F) = p(E) * p(F)$

Dependent Events ("Conditional" Rule): $p(E \cap F) = p(E) * p(F \mid E)$

3 Complement Rule:

$p(E') = 1 - p(E)$, where E' is the complement of event E.



KEY TAKEAWAYS

CHAPTER TITLE | **Probability Theory**

LECTURE TITLE | **Conditional Probability and Bayes Theorem**

1. **Conditional probability** means finding the **chance of an event happening** when we already know that another related event has occurred.

2. **Bayes' Theorem** is a mathematical formula for **determining conditional probability.**

3. The formula for Bayes' theorem is:

$$p(E \mid F) = p(F \mid E) \cdot p(E) / p(F)$$