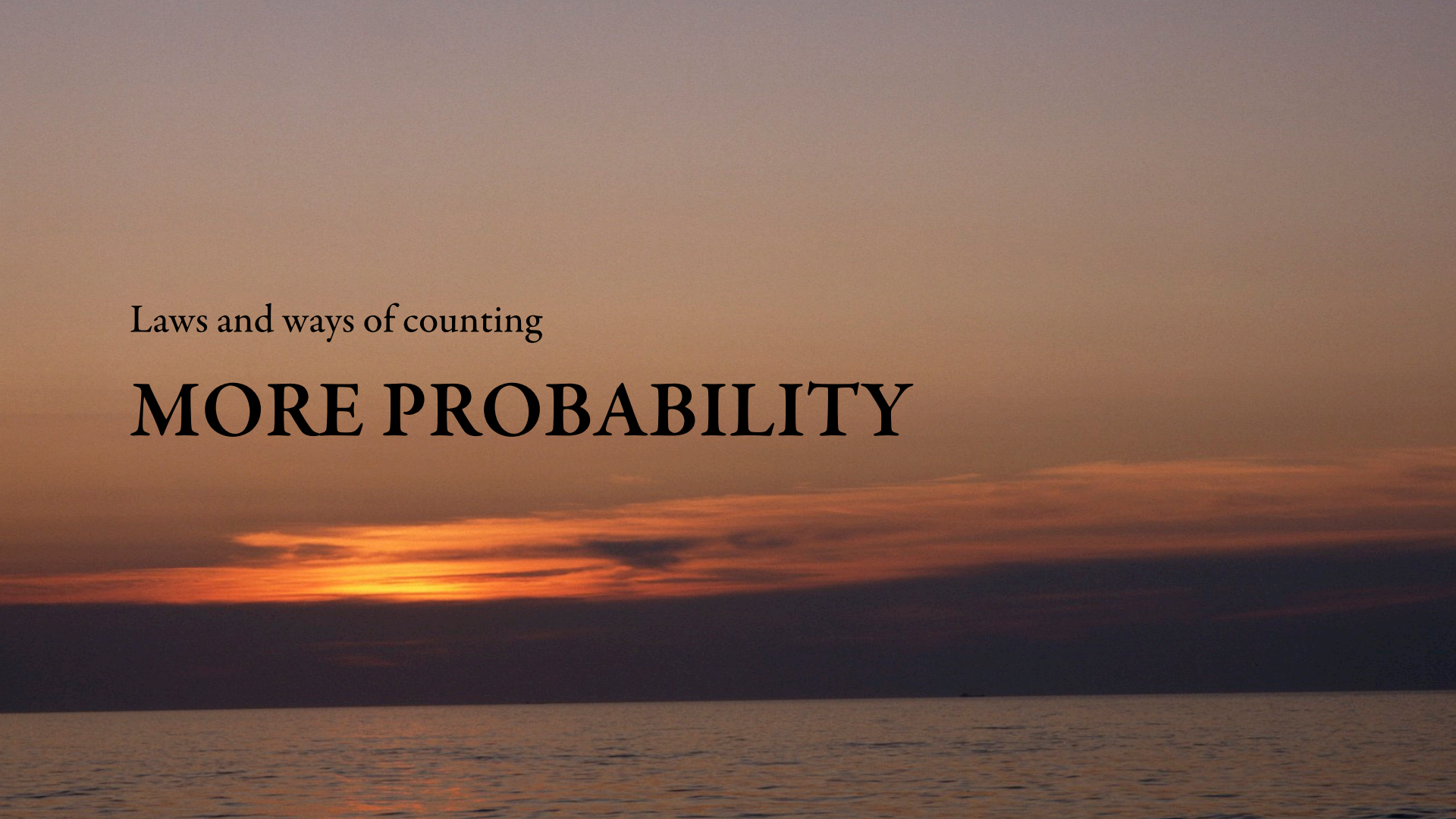
ASQ CRE Prep course

Lesson II. A. 2. b.

Basic Probability Concepts

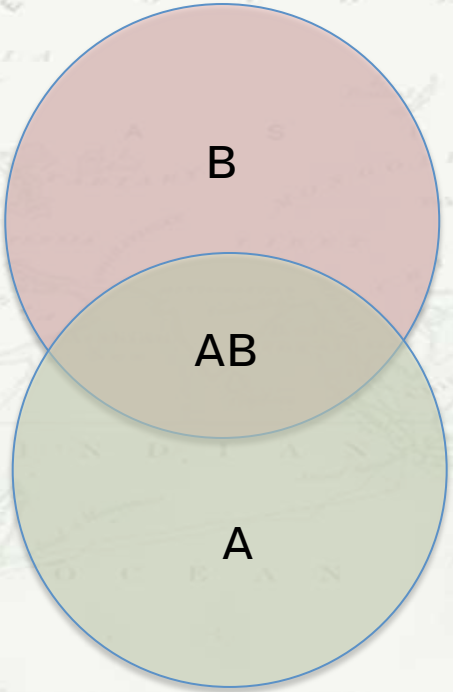
Laws and Counting



Laws and ways of counting

MORE PROBABILITY

Additive Law



$$
\begin{aligned}
P(A \cup B) &= P(A) + P(B) - P(A \cap B) \\
&= 0.65 + 0.65 - (0.65 \times 0.65) \\
&= 1.30 - 0.4225 \\
&= 0.8775
\end{aligned}
$$

Multiplicative Law

$$P(A \mid B) = \frac{P(A \cap B)}{P(B)}, P(B) \neq 0$$

If events A and B are independent, then

$$P(A \mid B) = P(A) \times P(B)$$

Permutations

The number of ways
that n distinct objects
can be **arranged** taking
them r at a time is:

$$P_r^n = n(n-1)(n-2)\cdots(n-r+1) = \frac{n!}{(n-r)!}$$

Combinations

The number of different combinations that can be formed from n distinct objects taken r at a time is:

$$C_r^n = \frac{n!}{r!(n-r)!}$$

When should you use permutations?

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Basic Probability Concepts

Expectation