



Probability Distributions & Expected Value

Today's Standard

HSS.MD.A3 - (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.

Cues	Notes
What is a probability distribution?	A probability distribution assigns probabilities to all possible outcomes of a random variable.
How to calculate expected value?	Expected value is the weighted average of all possible values of a random variable.
Examples of probability distributions	Examples include rolling a die, multiple-choice test outcomes.
Common misconceptions	Misconception: All outcomes have equal probabilities.
Interventions for misconceptions	Misconception: Expected value is always a possible outcome.

Summary

Probability distributions help us understand the likelihood of different outcomes for a random variable. The expected value is a key concept, representing the average outcome. Misconceptions include thinking all probabilities are equal and that the expected value must be an actual outcome.