

In your own words, describe how we use probability distributions to decide if we're pretty sure something is true or not. (This should be hard to write, spend time on it and be sure you really understand what you write.)

The k^{th} moment about the origin of a RV X (aka k^{th} moment), is given by

$$\mu'_k = E[X^k] = \sum_{\text{all } x} x^k f(x) \text{ or } \int_{\text{all } x} x^k f(x) dx \text{ for } k = 0, 1, 2, \dots$$

How is this definition isomorphic to a weighted average of the possible values of a RV?

How/why are the 1^{st} and 2^{nd} moments important for a probability distribution?
