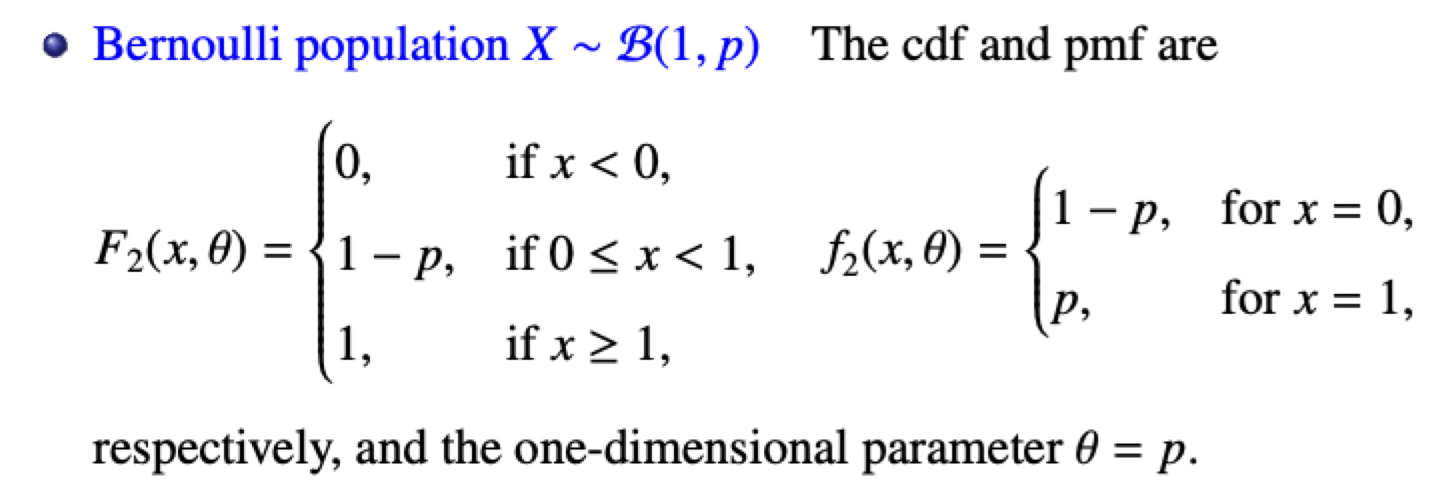
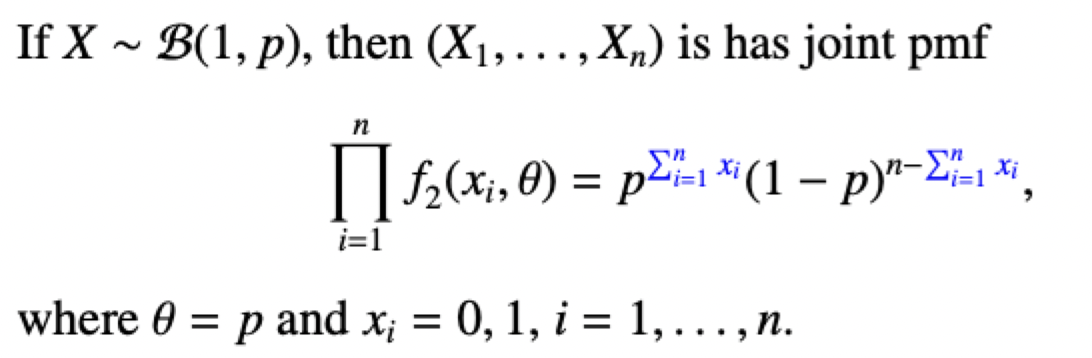
**Problem 1: Verify the joint pmf of the Bernoulli sample on page 9 of Slides02 and show**

**that it depends on the sample only through the sample mean.**

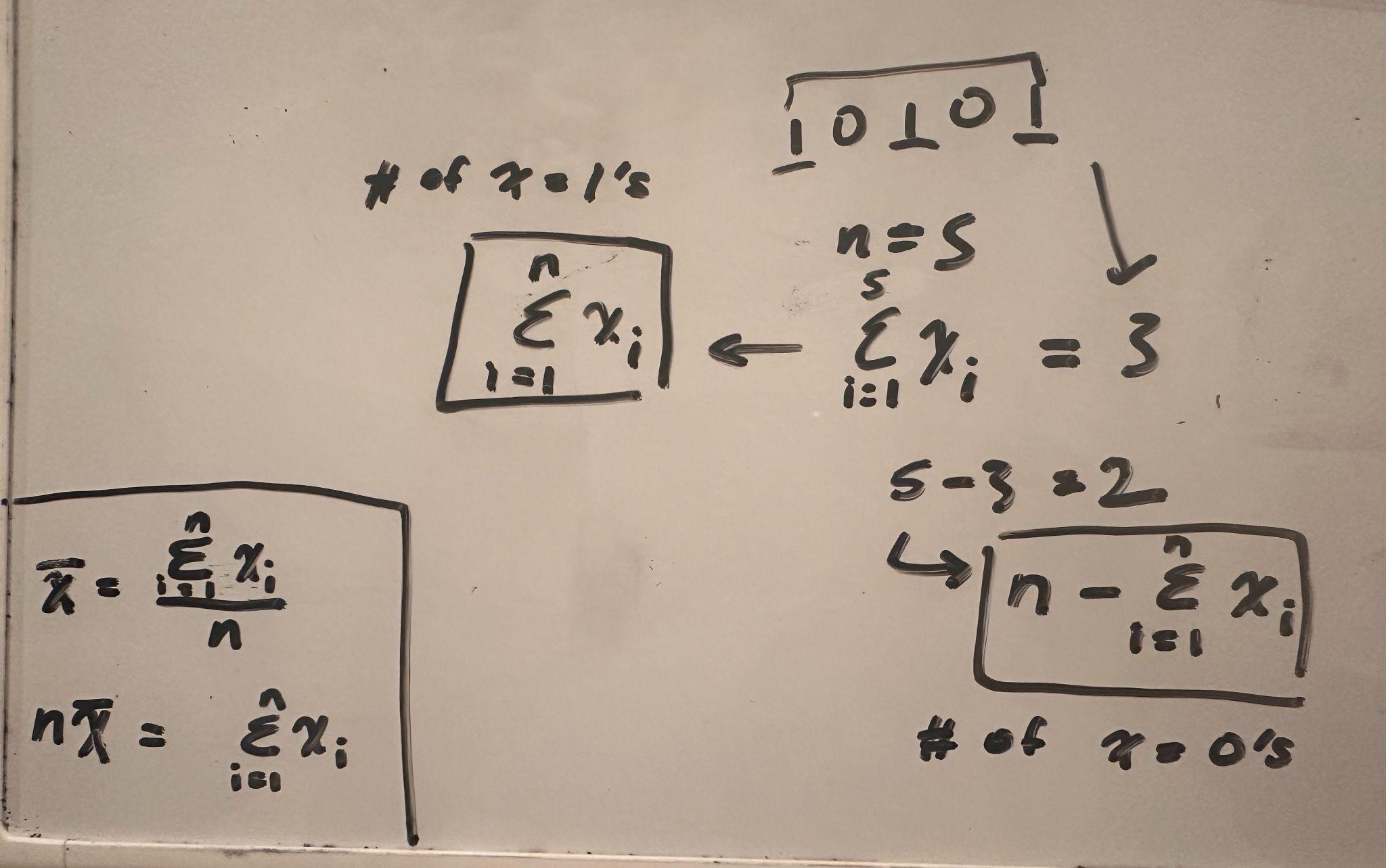
Slides02, page 7

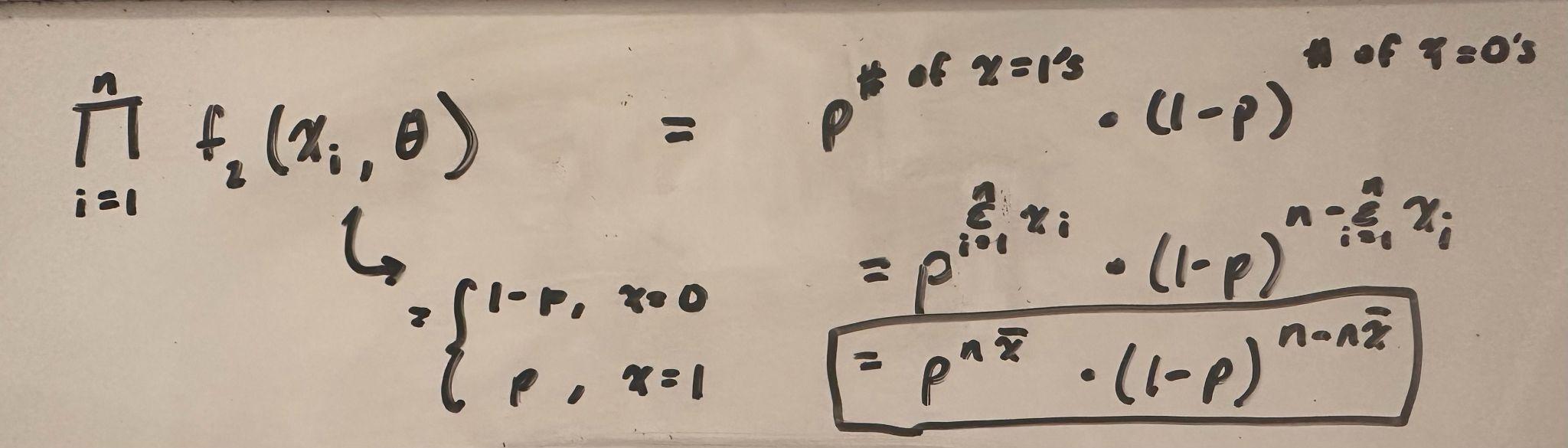


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Step 1 & 2: Relating the sample mean to the summations, figuring out the summations for the number of times we have x = 0 and x = 1

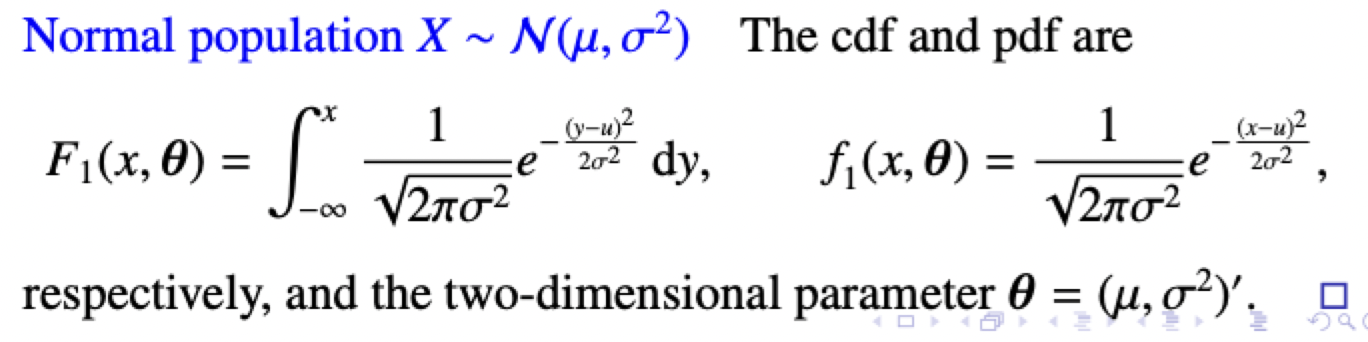


Step 3 & 4: Finding the product as it relates to the number of x = 0’s and x = 1’s, then substituting that in with n\*sample mean

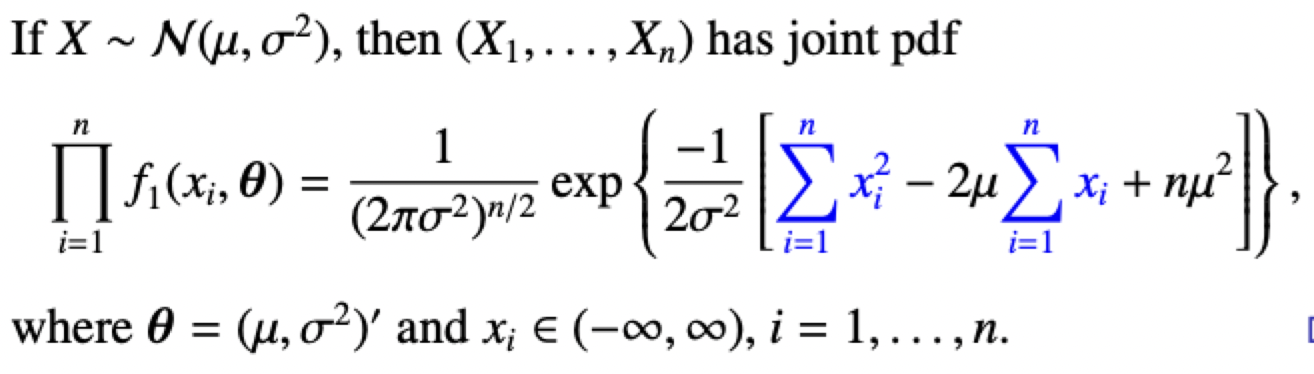
**Problem 2: Verify the joint pdf of the normal sample on page 9 of Slides02 and show**

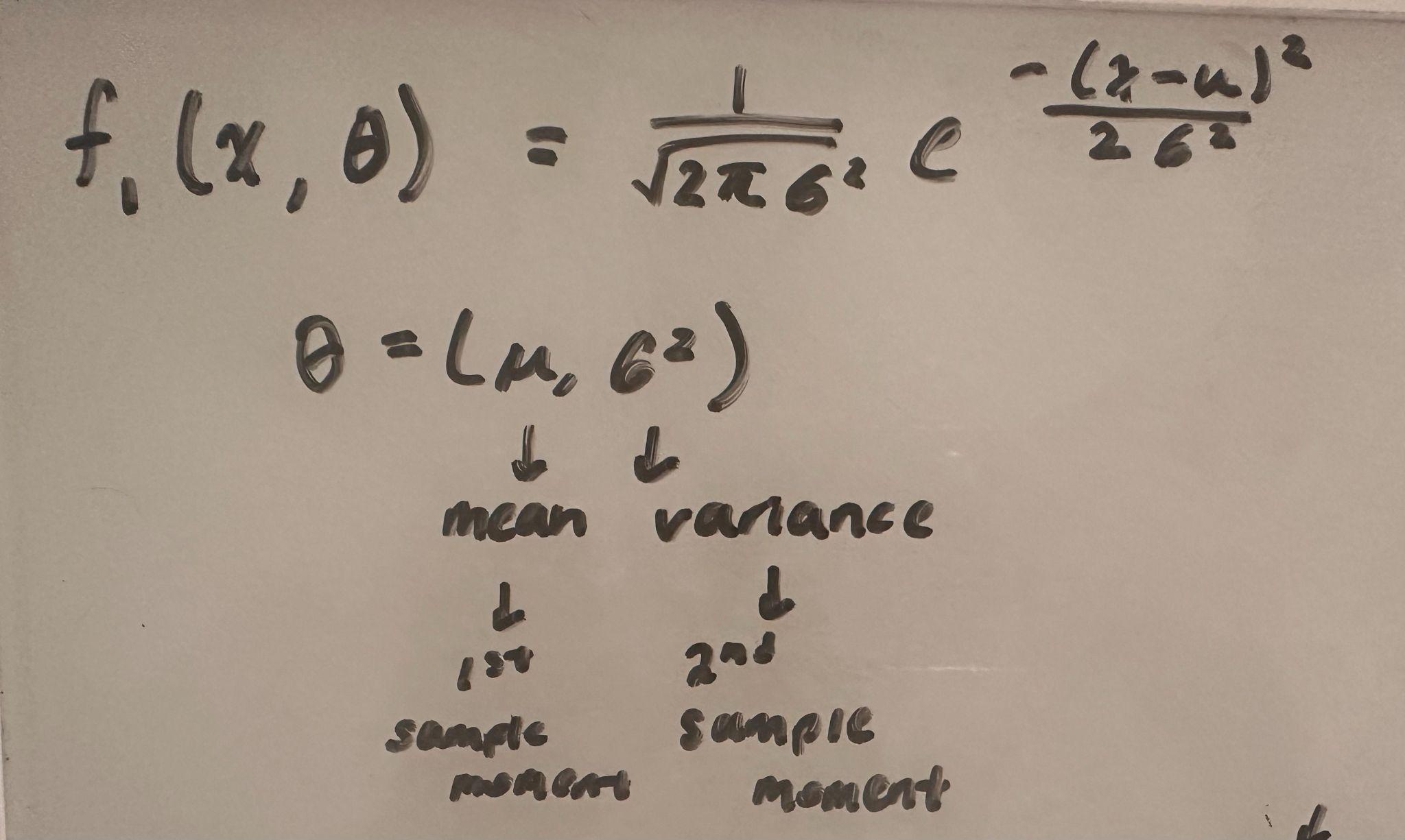
**that it depends on the sample only through the first two sample moments.**

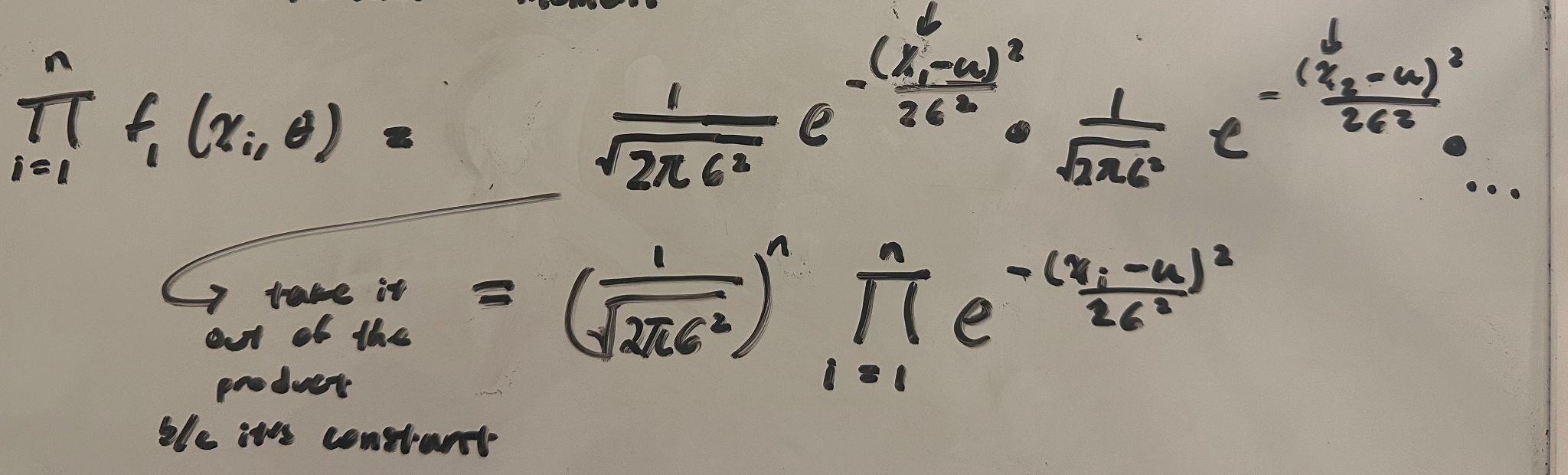
Slides02, page 7

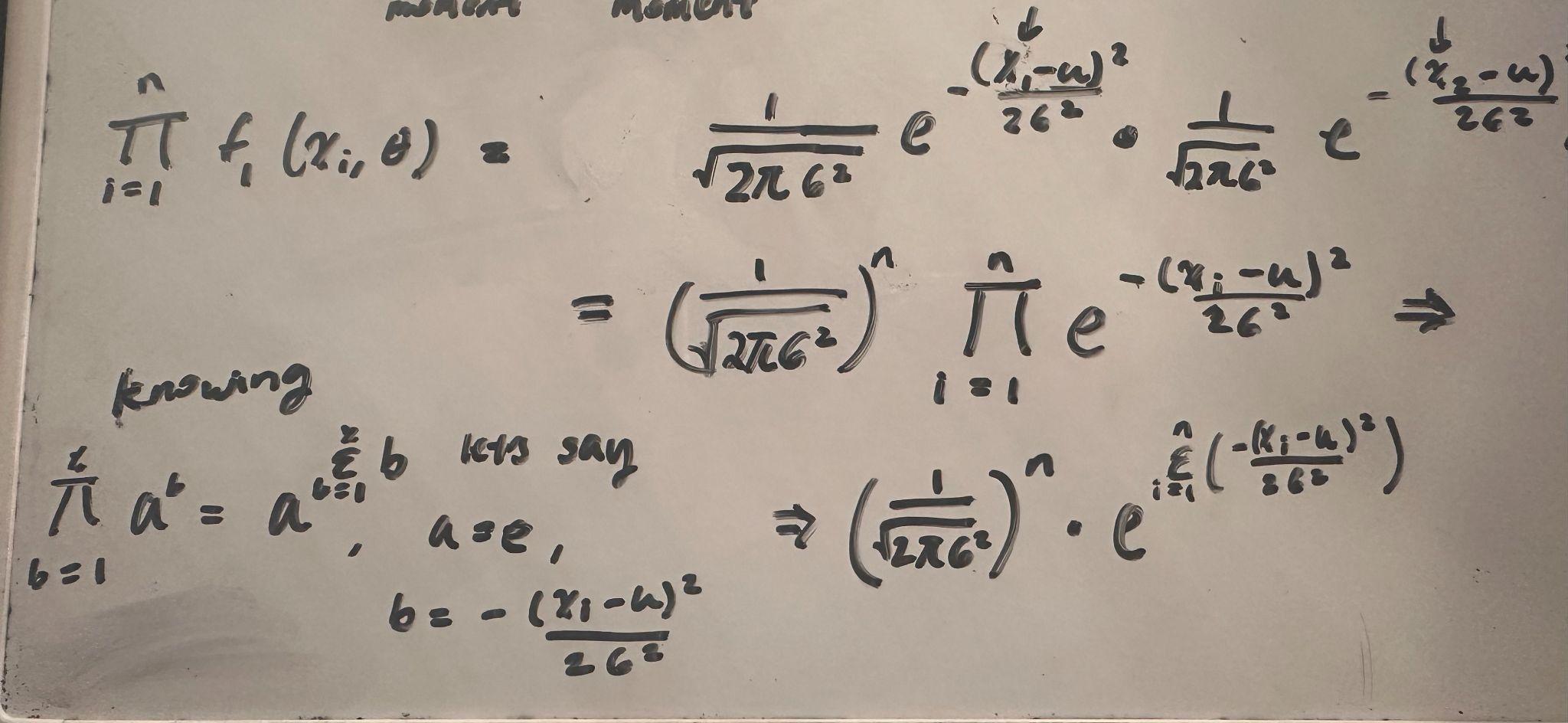


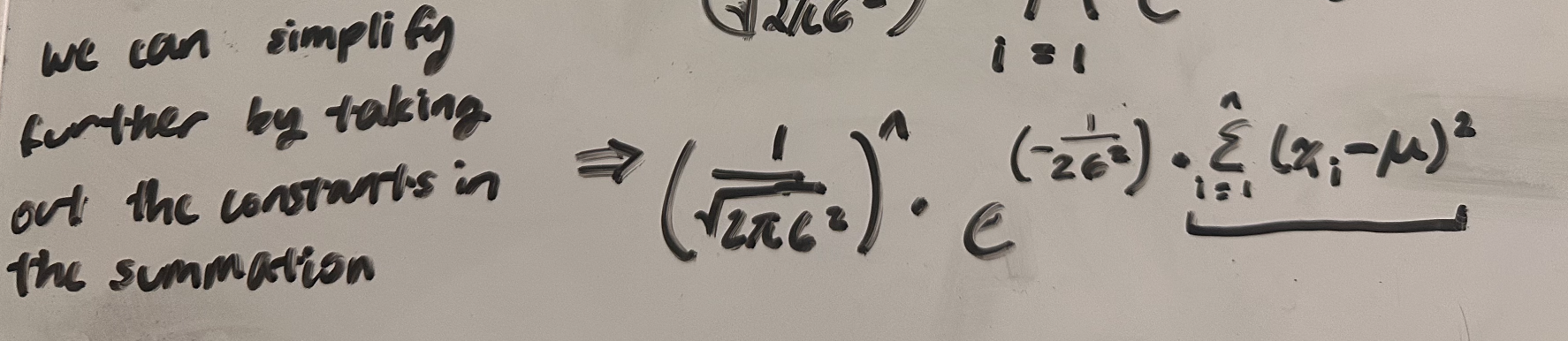
Slides02, page 9

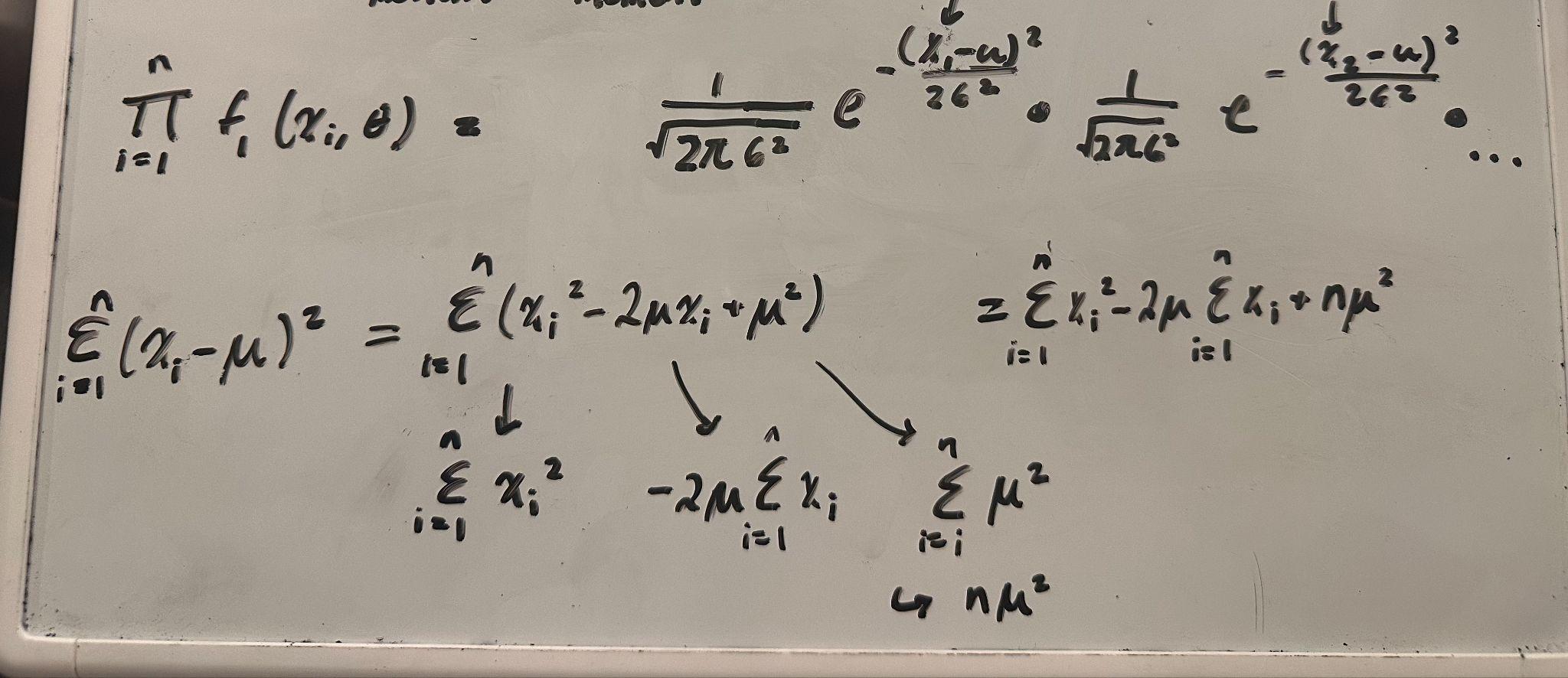


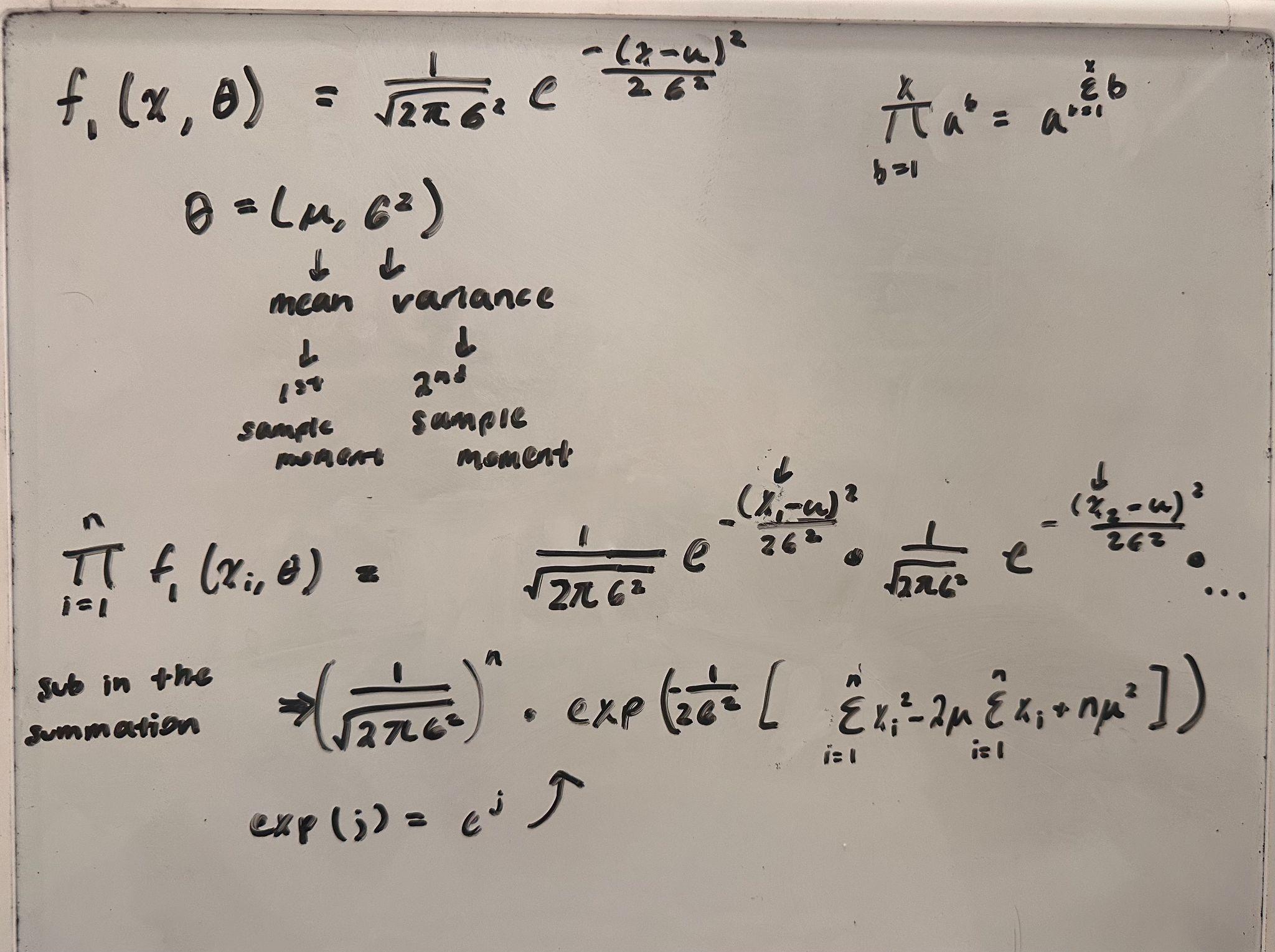


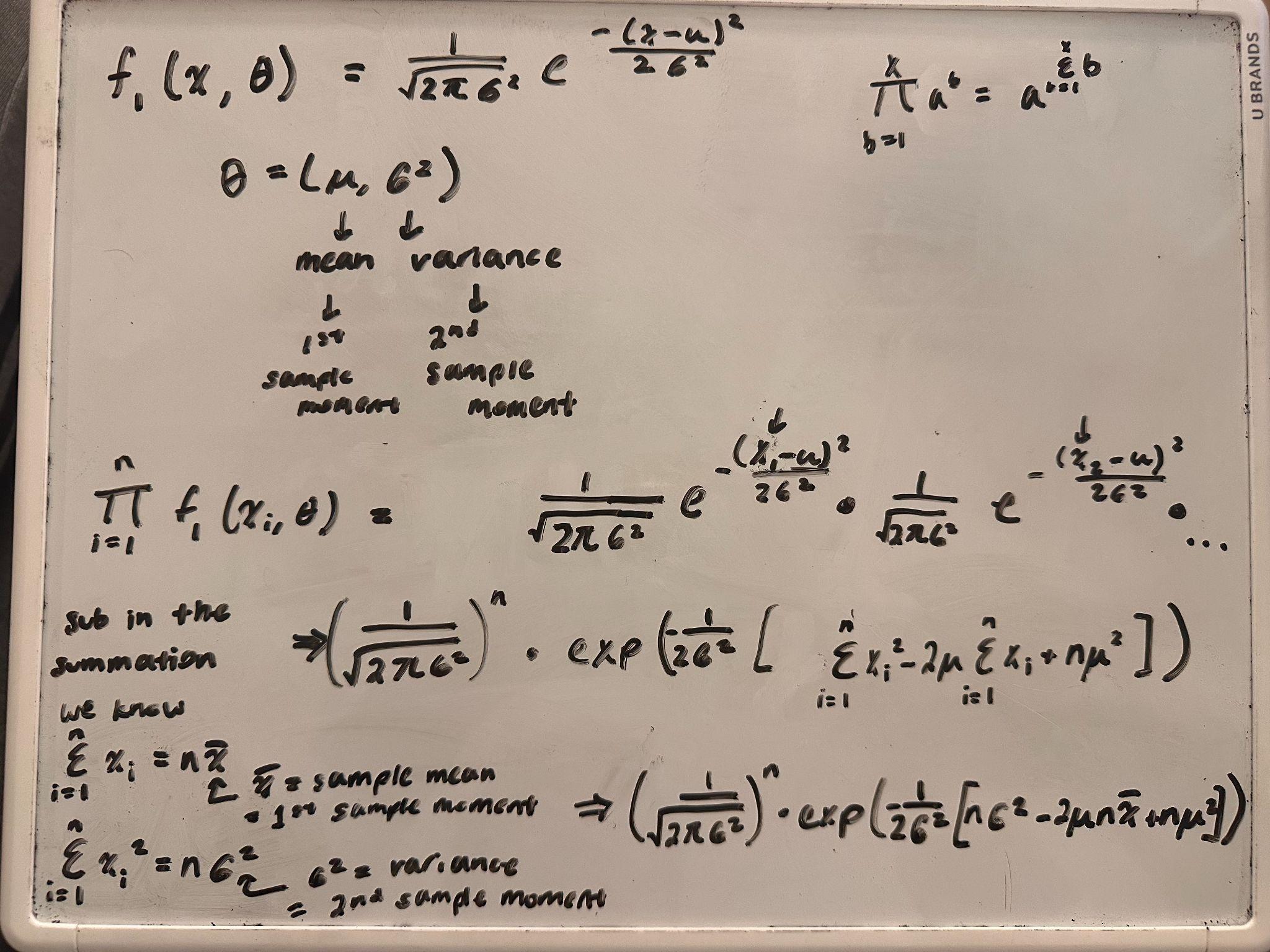








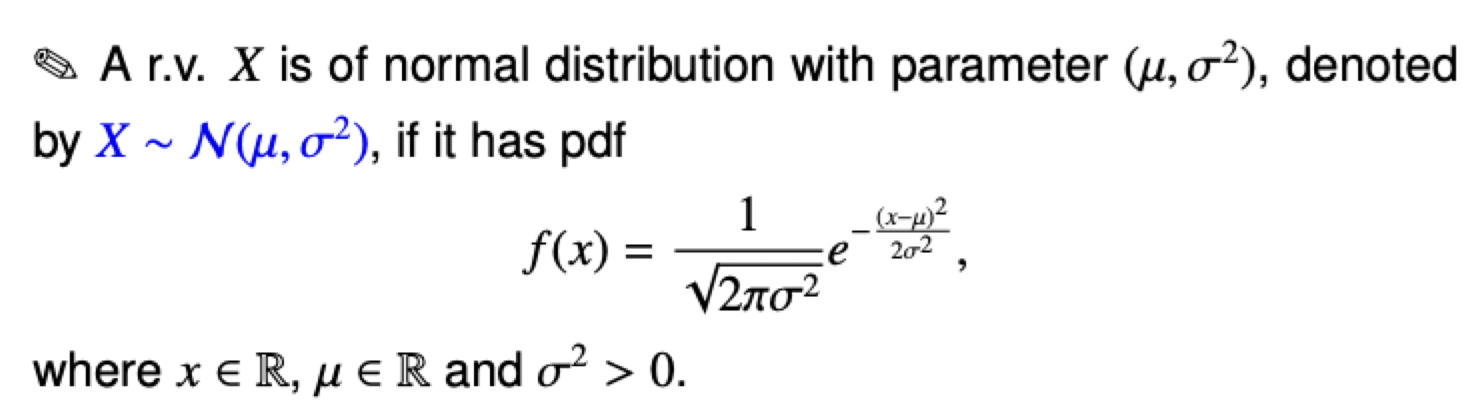




**Problem 3: Suppose X ∼ N (μ, σ2). Show that (X−μ)/σ ∼ N (0, 1), the standardization on**

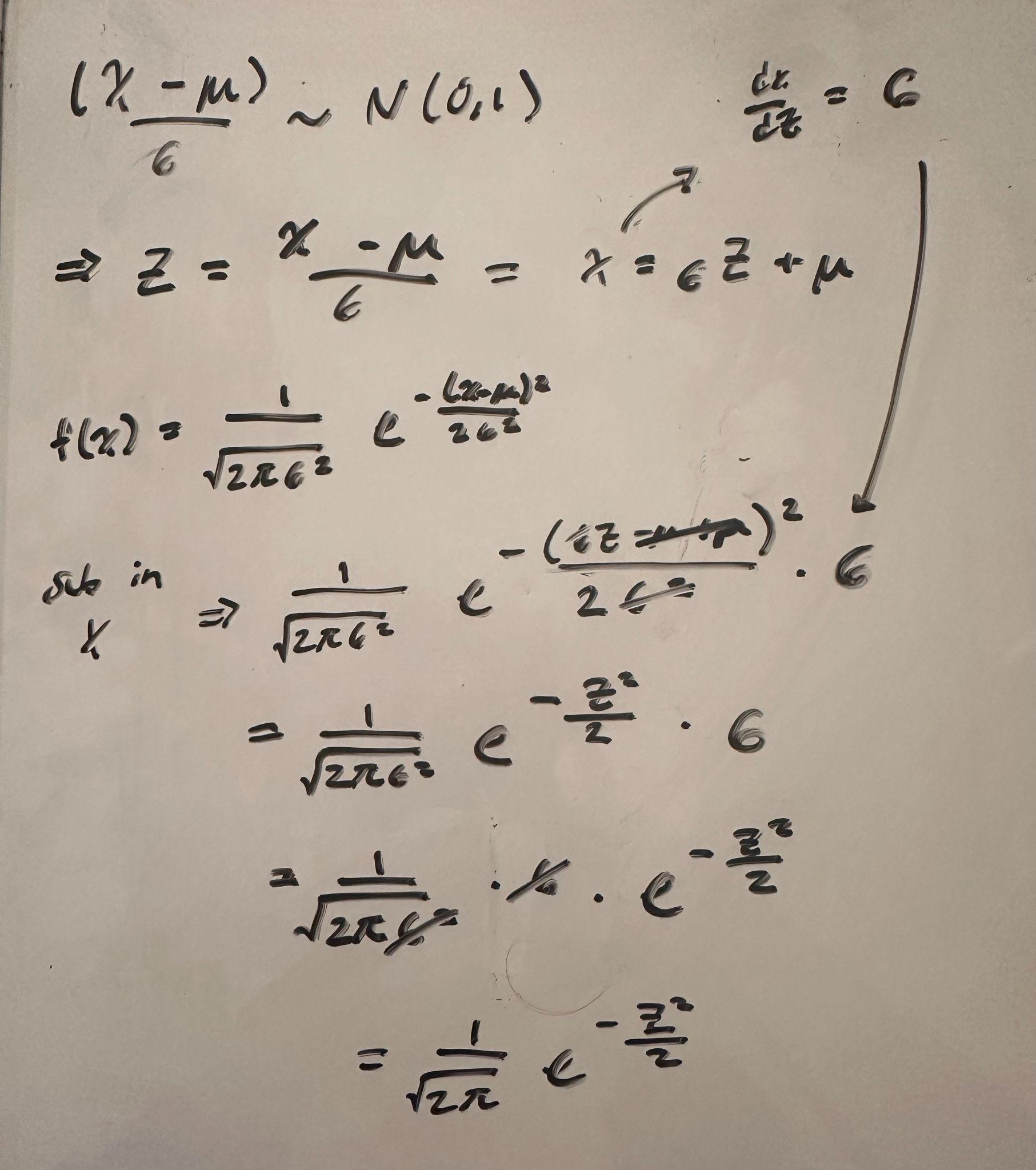
**page 20 of Slides02.**

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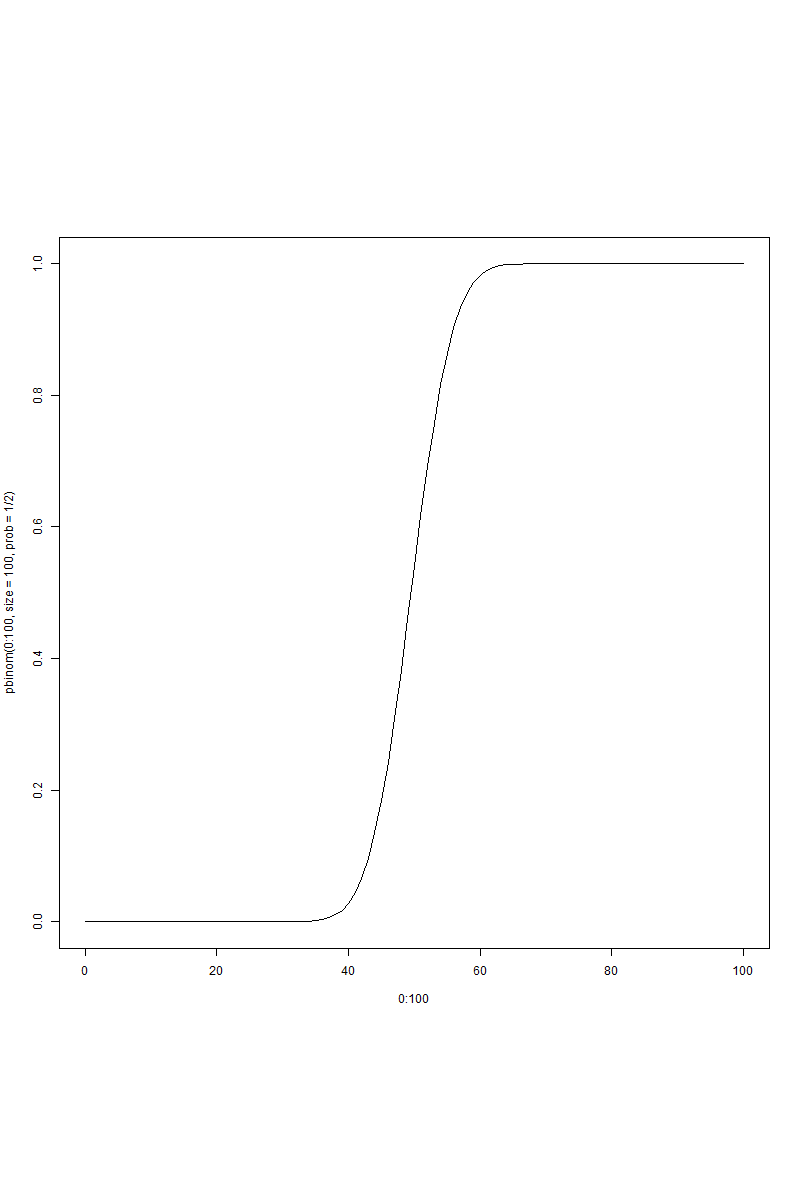
Slides02, page 20





**Problem 4**

1. The original population is the entire block of goods.
2. where .
3. , which means its cdf is:



**Problem 5**

1. No. When chosen with replacement, the sample is no longer a SRS.
2. The probability does not change per good, so .

**Problem 6**

1. Yes. Assuming they were randomly selected and each good is mutually independent, drawing with replacement will yield a SRS.
2. On the second trial, or , depending on if the first trial yielded a qualified or defective good, respectively.

**Problem 7**

1. , where some Xs may be observations of the same goods. , where all of the Xs will be observations of different goods.
2. . Both formulas are equal to . It makes sense because the data doesn't change, no matter how we sample it.
3. . The way we sample the data has changed, so it makes sense that the variance changes.