# Bayes Theorem

## In Naïve Bayes

where:

, *n* = number of samples  
: Posterior probability  
: Prior probability of , the class variable. Computed as the relative frequency of class in the training set.  
: Class conditional probability

# Prediction

Select the class with the highest probability among all the of each .

But generally, we take the **natural log of the probabilities** to avoid extremely small numbers.

[Scikit-learn notes](https://scikit-learn.org/stable/modules/naive_bayes.html):

Using the naive conditional independence assumption that

for all , this relationship is simplified to

Since  is constant given the input, we can use the following classification rule:

# Gaussian Naïve Bayes