• Why is Gaussian the most important h(x)?

o Because of the Central Limit Theorem:

Given an *arbitrary* distribution $h(x)$, characterized by its location μ and scale σ, the mean of N values x_i drawn from that distribution will approximately follow a Gaussian distribution with $N(\mu, \sigma/\sqrt{N})$, with the approximation accuracy improving with N.

o This is a remarkable result since the details of the distribution $h(x)$ are not specified - we can "average" our measurements (i.e., compute their mean value) and expect the $1/\sqrt{N}$ improvement in accuracy *regardless of details in our measuring apparatus!*

$$p(x|\mu,\gamma) = \frac{1}{\pi\gamma}\left(\frac{\gamma^2}{\gamma^2 + (x-\mu)^2}\right)$$

But note that it was implicitly assumed that h(x) has finite σ - not always true!
The Cauchy distribution: σ is undefined