Definition A family of distributions with probabilities mass function of density $f_x(\vec{x}|\vec{\theta})$ is said to be a k parameter exponential family if $f_x(x|\theta)$ has the form

$$f_x(x|\theta) = c(\theta)a(x)\exp\left[\sum_{i=1}^{k}\pi_i(\theta)t_i(x)\right]$$

$$c(\theta) = \frac{1}{\sum_x a(x)\exp\left[\sum_{i=1}^{k}\pi_i(\theta)t_i(x)\right]}$$