E

$f(x_{\mu,\sigma})$

location scale family.

$$E\left[(X - EX)^4\right]$$

$X_n - \frac{1}{n}\sum_n X_n$.

$$Y_n = \mu + \sigma X_n \quad \frac{X_n}{\hat{\sigma}}$$

$$\frac{1}{n}\sum Y_n = \mu + \sigma \frac{1}{n}\sum X_n.$$

$\mu + \sigma X_n$.

$$Y_n - \frac{1}{n}\sum Y_n = \mu + \sigma X_n - \left(\mu + \sigma \frac{1}{n}\sum X_n\right)$$

$\frac{1}{n} t_n \to 0$ as $n \to \infty$

$$= \sigma\left(X_n - \frac{1}{n}\sum X_n\right)$$

$$\hat{\sigma}$$

$$\hat{\sigma} = \sqrt{\frac{1}{n}\sum\left(X_i - \frac{1}{n}\sum X_i\right)}$$