$X_1 \sim \mathcal{N}(\mu_1, \sigma_1)$
$X_2 \sim \mathcal{N}(\mu_2, \sigma_2)$
$a > 0$
$X_1 + X_2$
$\mathcal{N}(\mu_1 + \mu_2, \sqrt{\sigma_1^2 + \sigma_2^2})$
aX_1
$\mathcal{N}(a\mu_1, |a|\sigma_1)$
$-X_1$
$\mathcal{N}(-\mu_1, +\sigma_1)$
X_1
X_2
X_3
$\mathcal{N}(\mu, \sigma^2)$
$X_1 + X_2 + X_3$
$\mathcal{N}(3\mu, \sqrt{3}\sigma)$
$3\,X_1$
$\mathcal{N}(3\mu, 3\sigma)$
$(X_1, ..., X_n)$
n
$\mathcal{N}(\mu, \sigma^2)$

$$Y = \frac{1}{n}\sum_{i=1}^{n} X_i$$

$\mathcal{N}(\mu, \frac{\sigma}{\sqrt{n}})$
n
$Z_1, ..., Z_n$
$\mathcal{N}(0, 1)$

$$\sum_{i=1}^{n} Z_i^2$$

$\chi^2(n)$
U
$\chi^2(n)$
U

$$f_U(x) = \begin{cases} \frac{1}{\Gamma(n/2)2^{n/2}} x^{n/2-1} e^{-x/2} si \\ 0 & si \leq 0 \end{cases}$$

Γ

$$\Gamma : z \mapsto \int_0^{+\infty} t^{z-1}\, e^{-t}\, \mathrm{d}t$$

Γ
Γ
$\{Re(z) > 0\}$
$\Gamma(1) = 1$
$\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$
$x > 0$
$\Gamma(x + 1) = x\Gamma(x)$
X
$\chi^2(n)$
$\overline{\overline{n}}$
$\sigma^2(X) = 2n$
$X_1, ..., X_n$
n
μ
σ
i
n

$$Z_i = \frac{X_i - \mu}{\sigma}$$

$\mathcal{N}(0, 1)$

$$U = \sum_{i=1}^{n} \left(\frac{X_i - \mu}{\sigma}\right)^2$$

$\chi^2(n)$
$=$
!