

$$\begin{array}{l} X_1 \sim \\ \mathcal{N}(\mu_1, \sigma_1) \\ X_2 \sim \\ \mathcal{N}(\mu_2, \sigma_2) \\ q > 0 \\ X_1 + \\ X_2 \\ \mathcal{N}(\mu_1 + \\ \mu_2, \sqrt{\sigma_1^2 + \sigma_2^2}) \\ aX_1 \\ \mathcal{N}(a\mu_1, |a|\sigma_1) \\ -X_1 \\ \mathcal{N}(-\mu_1, +\sigma_1) \end{array}$$

$$\begin{array}{l} X_1 \\ X_2 \\ X_3 \\ \mathcal{N}(\mu, \sigma^2) \\ X_1 + \\ X_2 + \\ X_3 \\ \mathcal{N}(3\mu, \sqrt{3}\sigma) \end{array}$$

$$\begin{array}{l} 3X_1 \\ \mathcal{N}(3\mu, 3\sigma) \\ (X_1,...,X_n) \\ \mathcal{N}(\mu, \sigma^2) \\ Y = \frac{1}{n} \sum_{i=1}^n X_i \end{array}$$

$$\begin{array}{l} \mathcal{N}(\mu, \frac{\sigma}{\sqrt{n}}) \\ \mathbb{Z}_1,...,Z_n \\ \mathcal{N}(0,1) \end{array}$$

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

$$\begin{array}{l} \chi^2(n) \\ U \\ \chi^2(n) \\ U \end{array}$$

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

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

$$\begin{array}{l} \Gamma \\ \Gamma \\ \{Re(z)>0\} \\ \Gamma(1)=1 \\ \Gamma\left(\frac{1}{2}\right)=\sqrt{\pi} \end{array}$$

$$\begin{array}{l} x>0 \\ \Gamma(x+1)=x\Gamma(x) \\ X \\ \chi^2(n) \\ \overline{\overline{n}} \\ \sigma^2(X)=\frac{2n}{X_1,...,X_n} \\ \overline{\overline{\mu}} \\ \overline{\overline{\sigma}} \\ h \end{array}$$

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

$$\begin{array}{l} \mathcal{N}(0,1) \\ U = \sum_{i=1}^n \left(\frac{X_i - \mu}{\sigma}\right)^2 \end{array}$$

$$\begin{array}{l} \chi^2(n) \\ \overline{\overline{\Gamma}} \\ \Gamma^{(2)}(\cdot) \end{array}$$