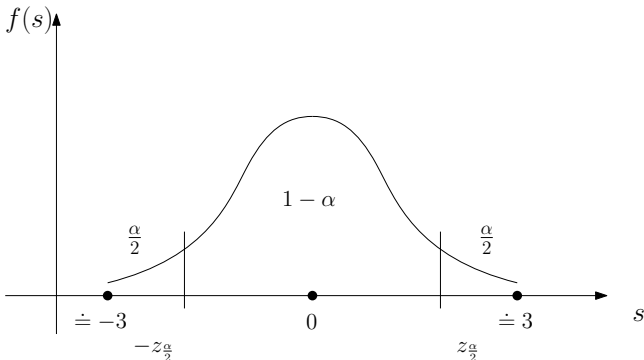


Standard and nonstandard normal distribution

Let us have normal random variable s for which it is $E[s] = 0, D[s] = 1$. Its distribution is



The transformation equation from standard s to nonstandard x variable with $E[s] = \mu, D[s] = \sigma^2$ is

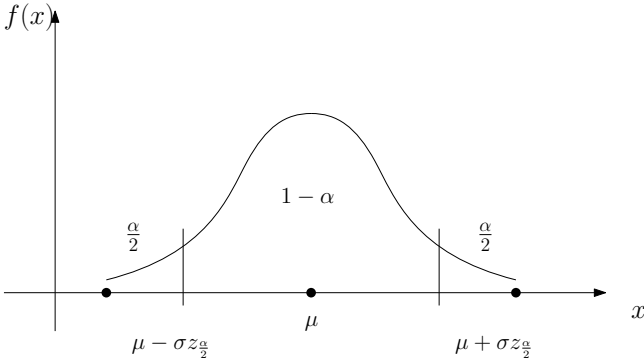
$$x = \mu + \sigma s$$

with back transformation

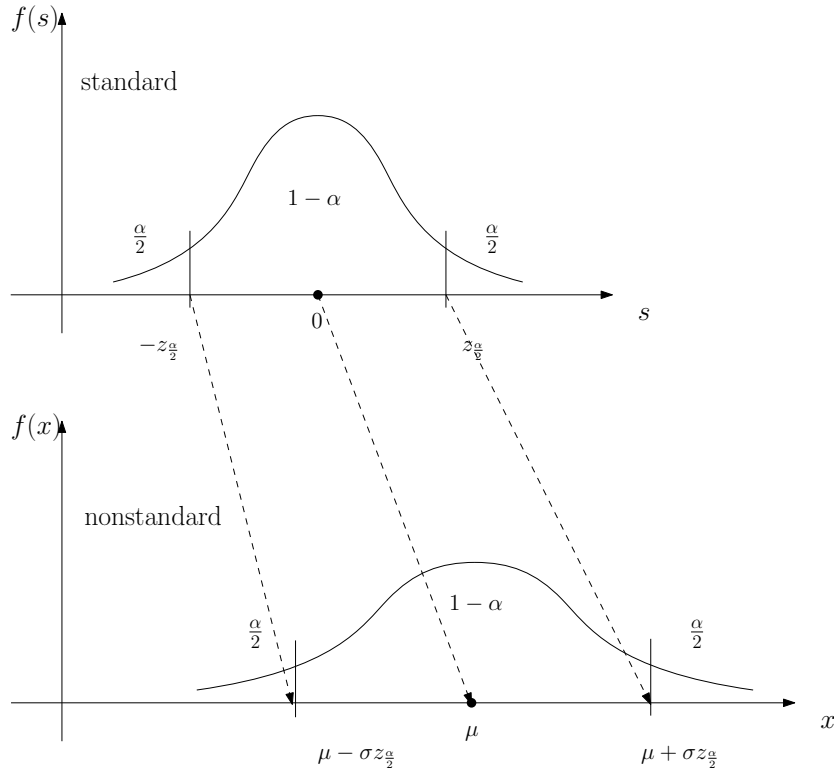
$$s = \frac{x - \mu}{\sigma}$$

(σ performs contraction/dilatation and μ shift).

The nonstandard random variable has the distribution



The transformation works like this



Remark

Interval for μ is

$$\left(\bar{x} - \frac{\sigma}{\sqrt{n}} z_{\frac{\alpha}{2}}, \bar{x} + \frac{\sigma}{\sqrt{n}} z_{\frac{\alpha}{2}} \right)$$

as the statistics is \bar{x} with expectation μ and variance $\frac{\sigma^2}{n}$.