

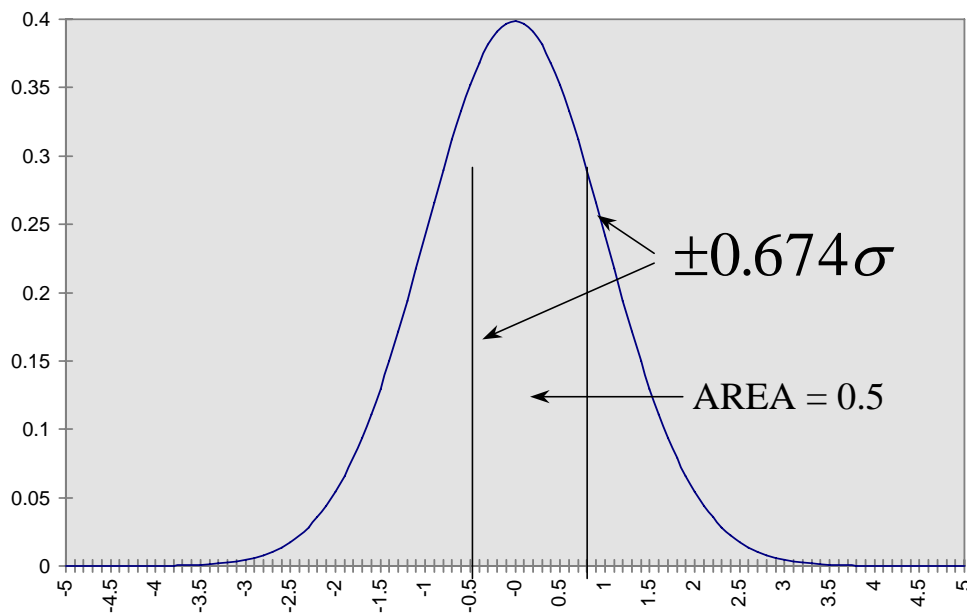
**The Standard Normal Distribution:**

$$\mu = 0, \sigma = 1$$

$$z = \frac{x - \mu}{\sigma}, dz = \frac{1}{\sigma} dx$$

$$P(a < z < b) = \int_a^b \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}} dz$$

**Error Probable:** An error budget that would contain half of the population data points. Assumes that events are independent and identically distributed (iid). **Also assumes N is large (greater than 30), or population is normally distributed.**

**Circular Error Probable – the 2 Dimensional Case (X error and Y error):**

$$\text{If } \sigma_x < \sigma_y \text{ and } \frac{\sigma_x}{\sigma_y} \leq 0.28 \text{ then } \text{CEP} = 0.562\sigma_x + 0.615\sigma_y$$

$$\text{If } \sigma_x > \sigma_y \text{ and } \frac{\sigma_y}{\sigma_x} \leq 0.28 \text{ then } \text{CEP} = 0.615\sigma_x + 0.562\sigma_y$$

$$\text{Otherwise } \text{CEP} = 0.5887 (\sigma_x + \sigma_y)$$