$\frac{\bar{Y}_n - \mu}{\sigma} \sqrt{n}$ pivotale normale standard usate per I.C.

$H_0 : \mu = \mu_0$

$H_A : \mu > \mu_0$

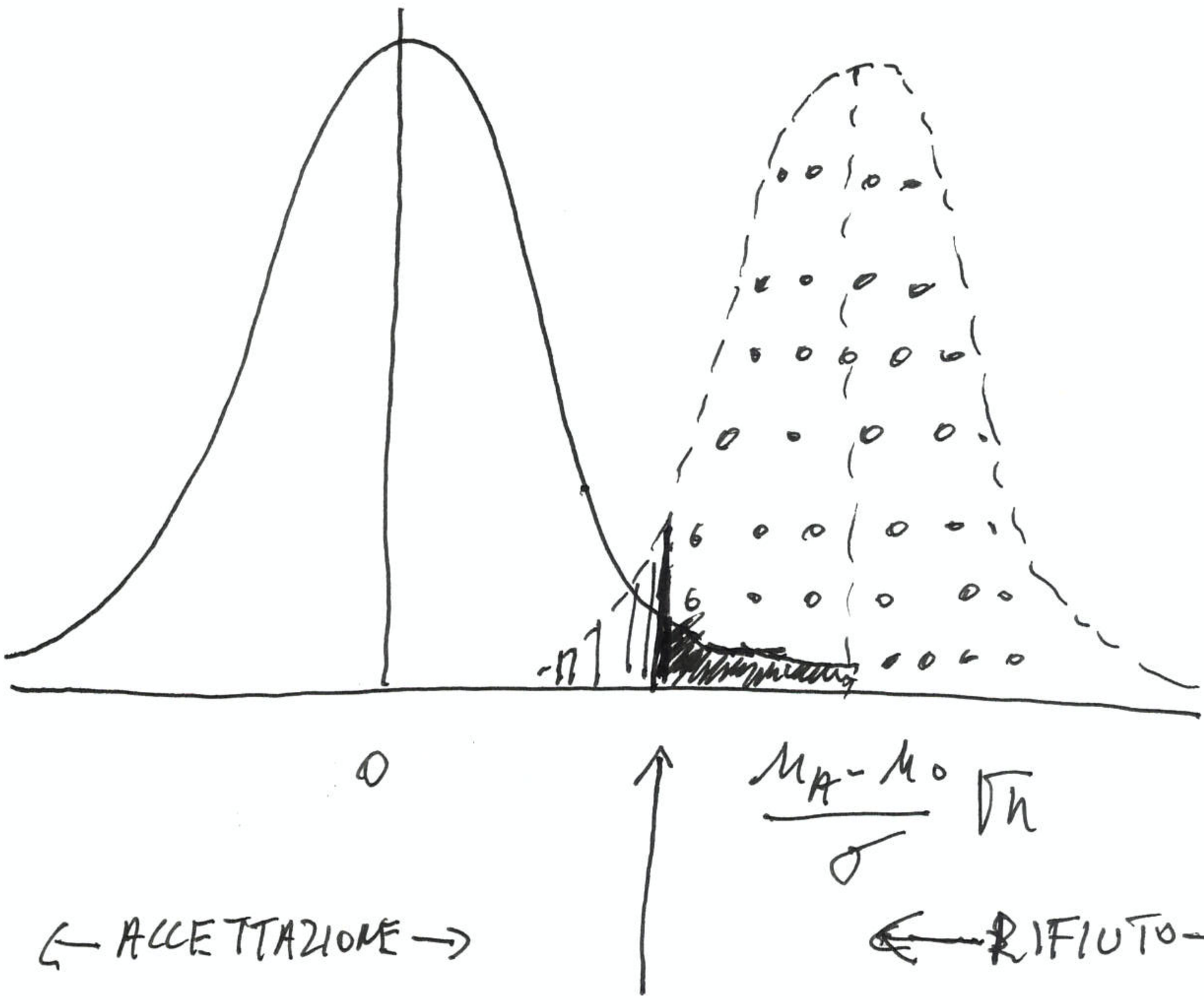
$\frac{\bar{Y}_n - \mu_0}{\sigma} \sqrt{n}$ Statistica normale standard se vere H_0

se vere alternative $\mu = \mu_A > \mu_0$

$$E\left(\frac{\bar{Y}_n - \mu_0}{\sigma}\sqrt{n}\right) = \frac{\mu_A - \mu_0}{\sigma}\sqrt{n} > 0$$

$$Var\left(\frac{\bar{Y}_n - \mu_0}{\sigma}\sqrt{n}\right) = 1$$

$\frac{\mu_A - \mu_0}{\sigma} \sqrt{n} = \lambda_n$ PARAMETRO NON CENTRALITÀ

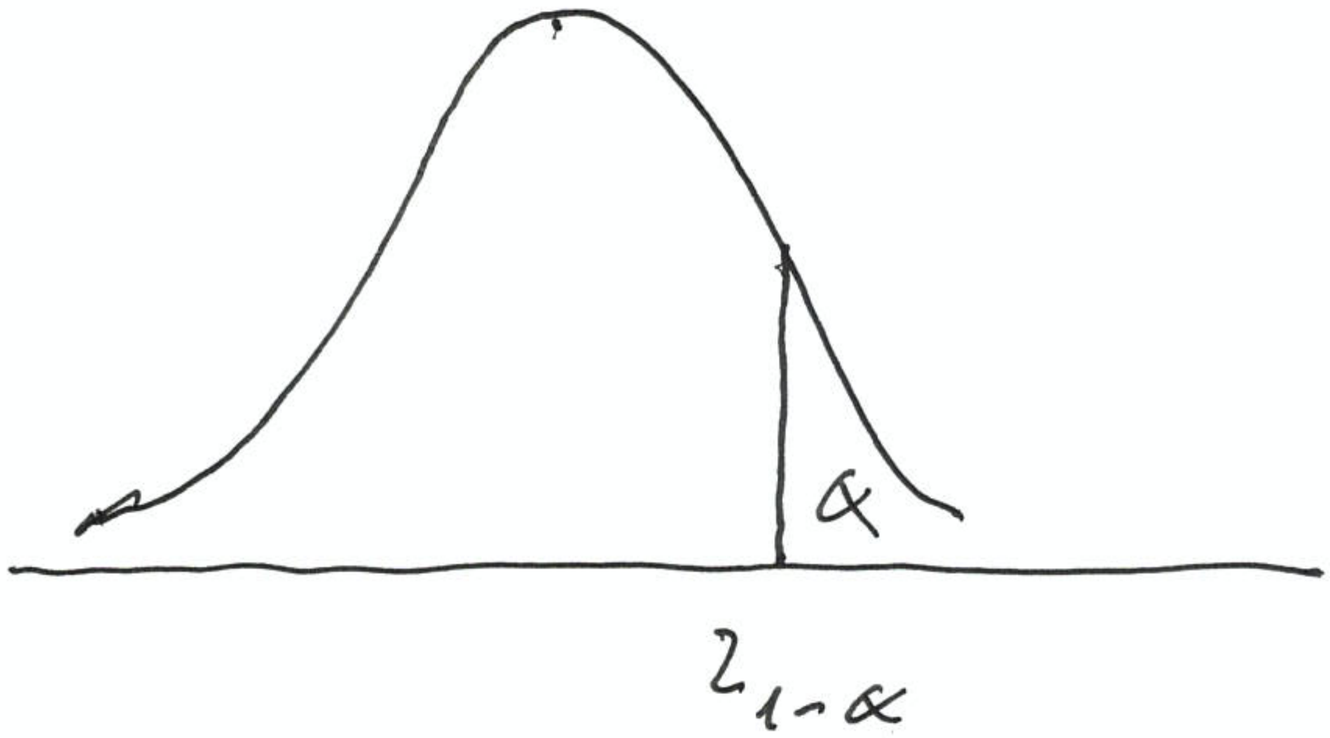


▨ α livello significatività
probabilità errore I tipo

//// β probabilità errore
seconda tipo ($\overline{II}$)

. . e . . π potenza
. . c . .

SCELTA VALORE CRITICO



$$p\left(\frac{\mu_n - \mu_0}{\sigma}\sqrt{n} > z_{1-\alpha}\right) = \alpha$$

$c = z_{1-\alpha}$ il valore critico è $1-\alpha$ percentile

Calcolo potenza

$$\pi = P\left(\frac{\mu_n - \mu_0}{\sigma}\sqrt{n} > z_{1-\alpha}\right) =$$

$$= P\left(\frac{\mu_n - \mu_A}{\sigma}\sqrt{n} + \frac{\mu_A - \mu_0}{\sigma}\sqrt{n} > z_{1-\alpha}\right)$$

$$= P\left(\frac{\mu_n - \mu_A}{\sigma}\sqrt{n} > z_{1-\alpha} - \frac{\mu_A - \mu_0}{\sigma}\sqrt{n}\right)$$

$$= 1 - \Phi\left(z_{1-\alpha} - \frac{\mu_A - \mu_0}{\sigma}\sqrt{n}\right)$$

$$= 1 - \Phi\left(z_{1-\alpha} - \frac{\mu_A - \mu_0}{\sigma}\sqrt{n}\right)$$

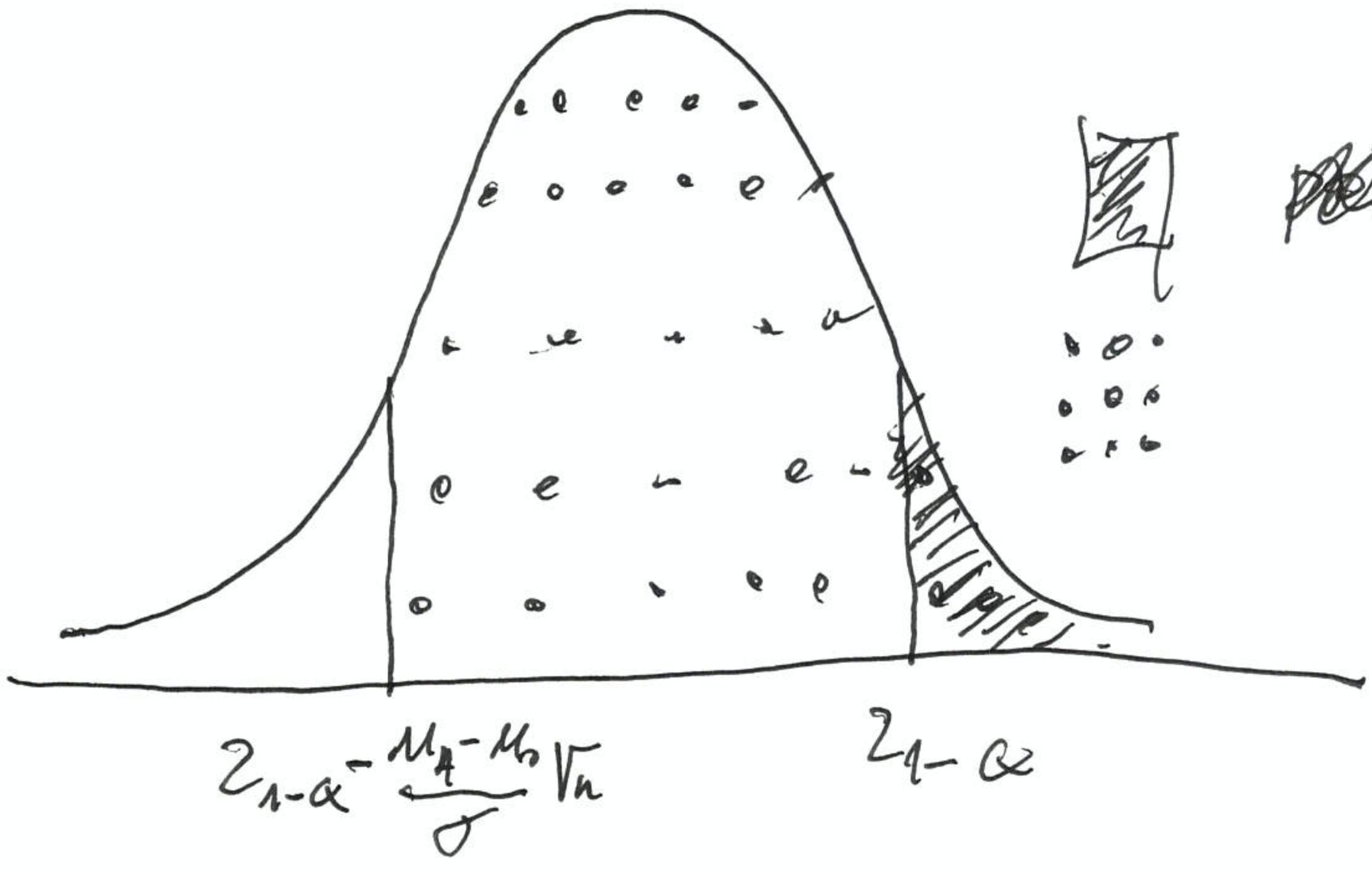
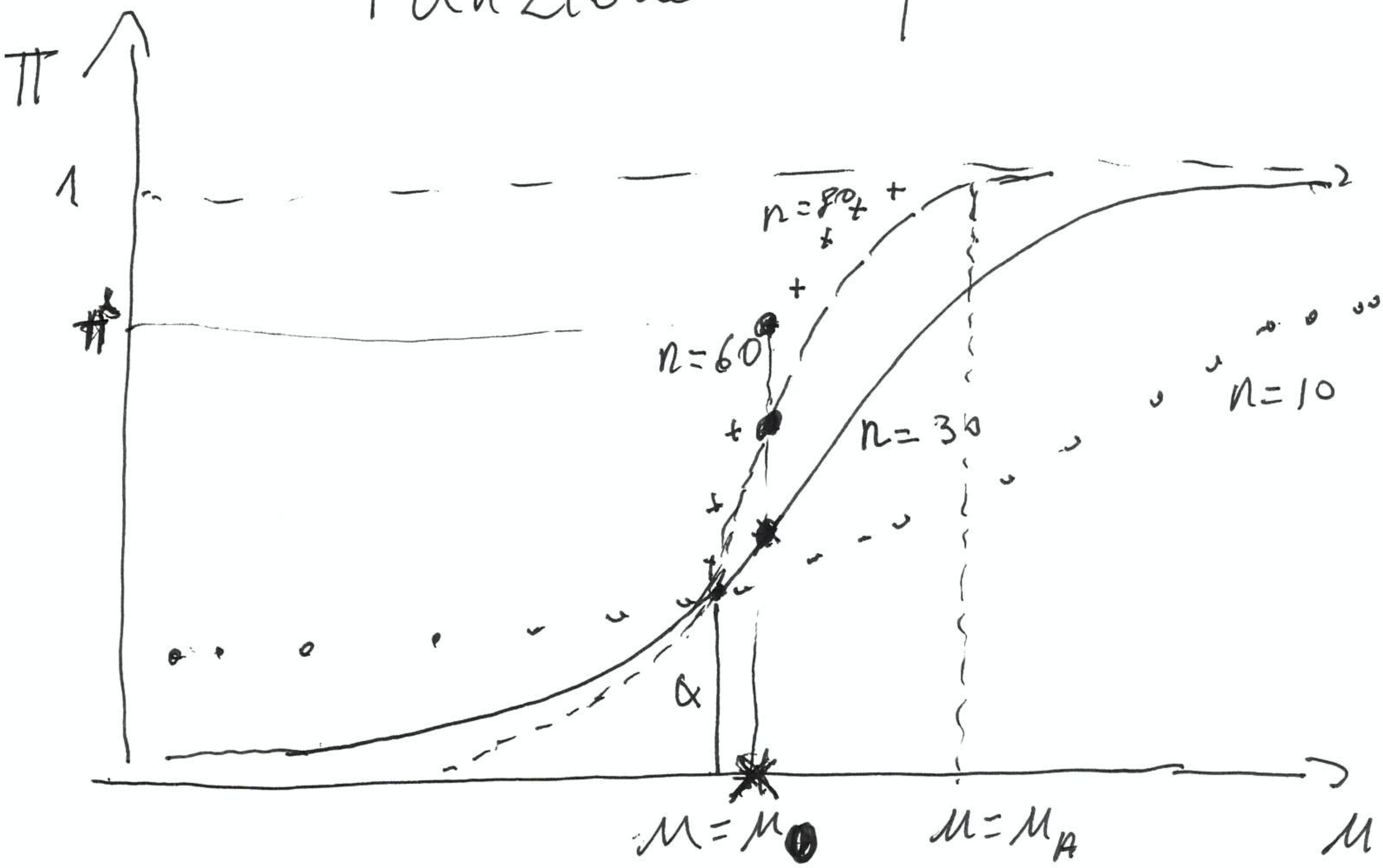


Figura α

π

Funzione di potenza



Determinazione numerosità campionaria

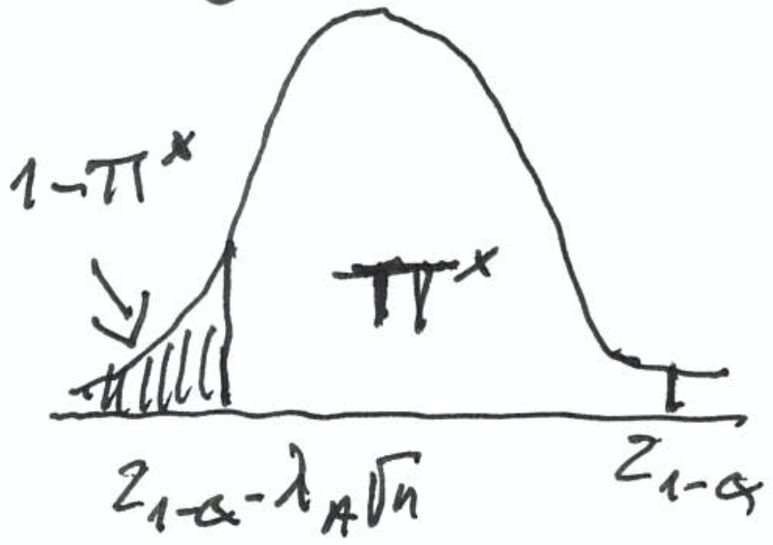
1) fisso α e trovo $c = z_{1-\alpha}$

2) cerco n t.le che dato $\pi_A > \pi_0$

$$1 - \Phi\left(z_{1-\alpha} - \lambda_A \sqrt{n}\right) = \pi^*$$

$$\lambda_A = \frac{\mu_A - \mu_0}{\sigma}$$

$$\Phi\left(z_{1-\alpha} - \lambda_A \sqrt{n}\right) = 1 - \pi^*$$



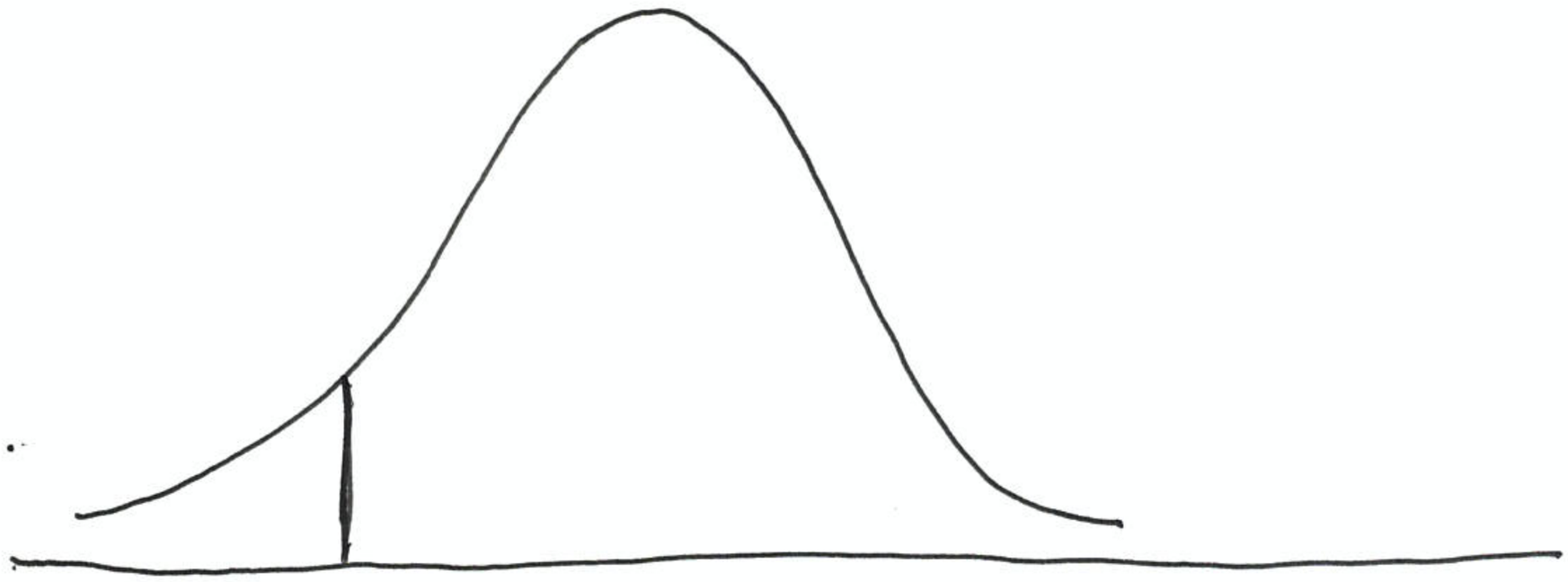
$$z_{1-\alpha} - \lambda_A \sqrt{n} = z_{1-\pi^*}$$

$$\left(\frac{z_{1-\alpha} - z_{1-\pi^*}}{\lambda_A}\right)^2 = n$$

→ maggiore π^* più grande n

→ più è piccolo maggiore sarà n

Alternative SX

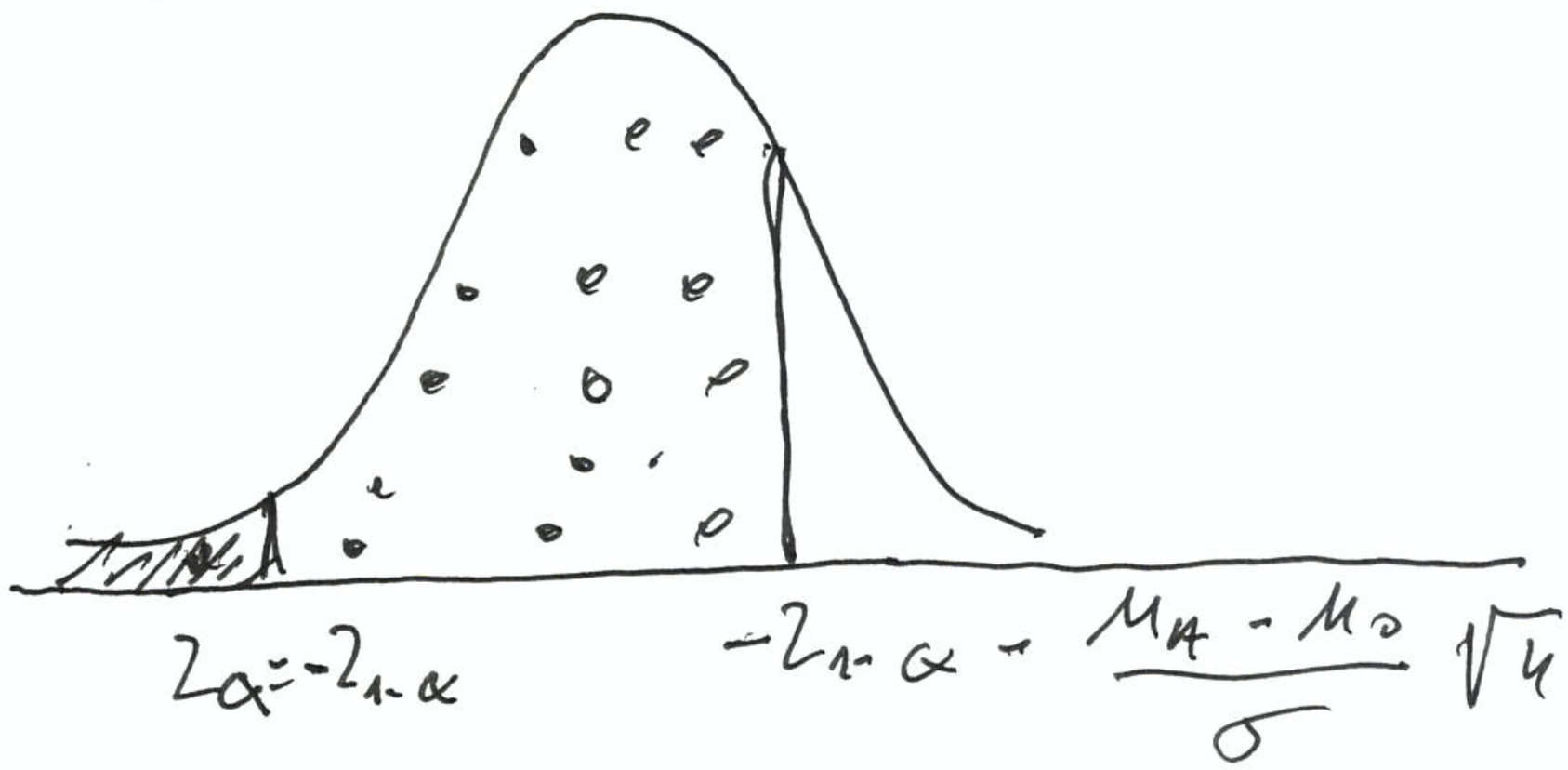


$$c = z_\alpha = -z_{(1-\alpha)}$$

$$P\left(\left(\frac{\mu_n - \mu_0}{\sigma}\sqrt{n}\right) < -z_{1-\alpha}\right) = \alpha$$

POTENZA

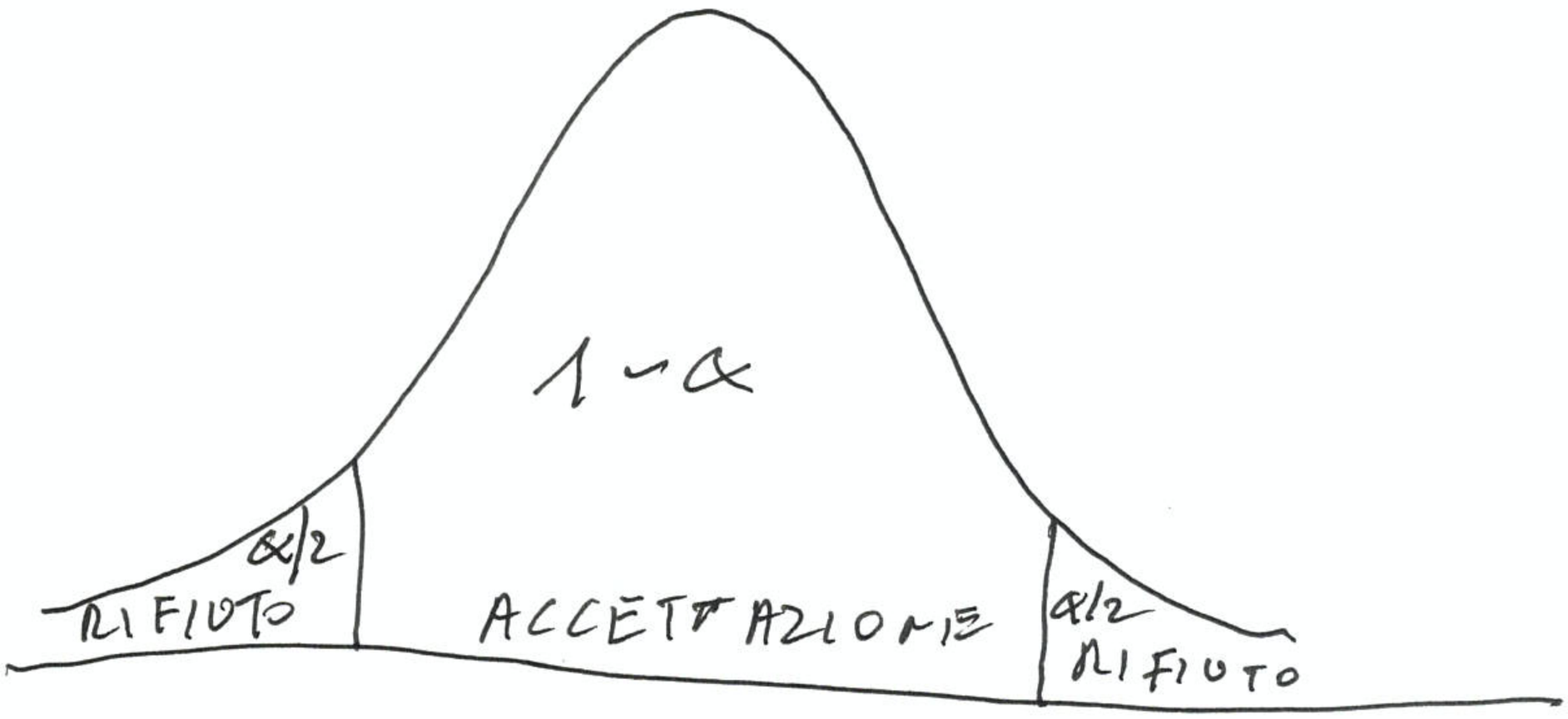
$$\pi = \Phi\left(-z_{1-\alpha} + \frac{\mu_A - \mu_0}{\sigma}\sqrt{n}\right)$$



α

π

BILATERALE



$z_{\alpha/2} = -z_{1-\alpha/2}$

$z_{1-\alpha/2}$

POTENZA

VEDI SLIDES