One sample Z test power

Compute rejection
points with this
dist?,
assuming μ_0

Power

Compute power with
this dist?, assuming μ_1

$\alpha/2$

$\alpha/2$

μ_0
null

μ_1
alternative

lower
rejection

upper rejection

$U = \mu_0 + Z_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$

Level α test
finds this point
for given α.

$L = \mu_0 - Z_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$

1.96 for $\alpha = 0.05$

Rejection region,
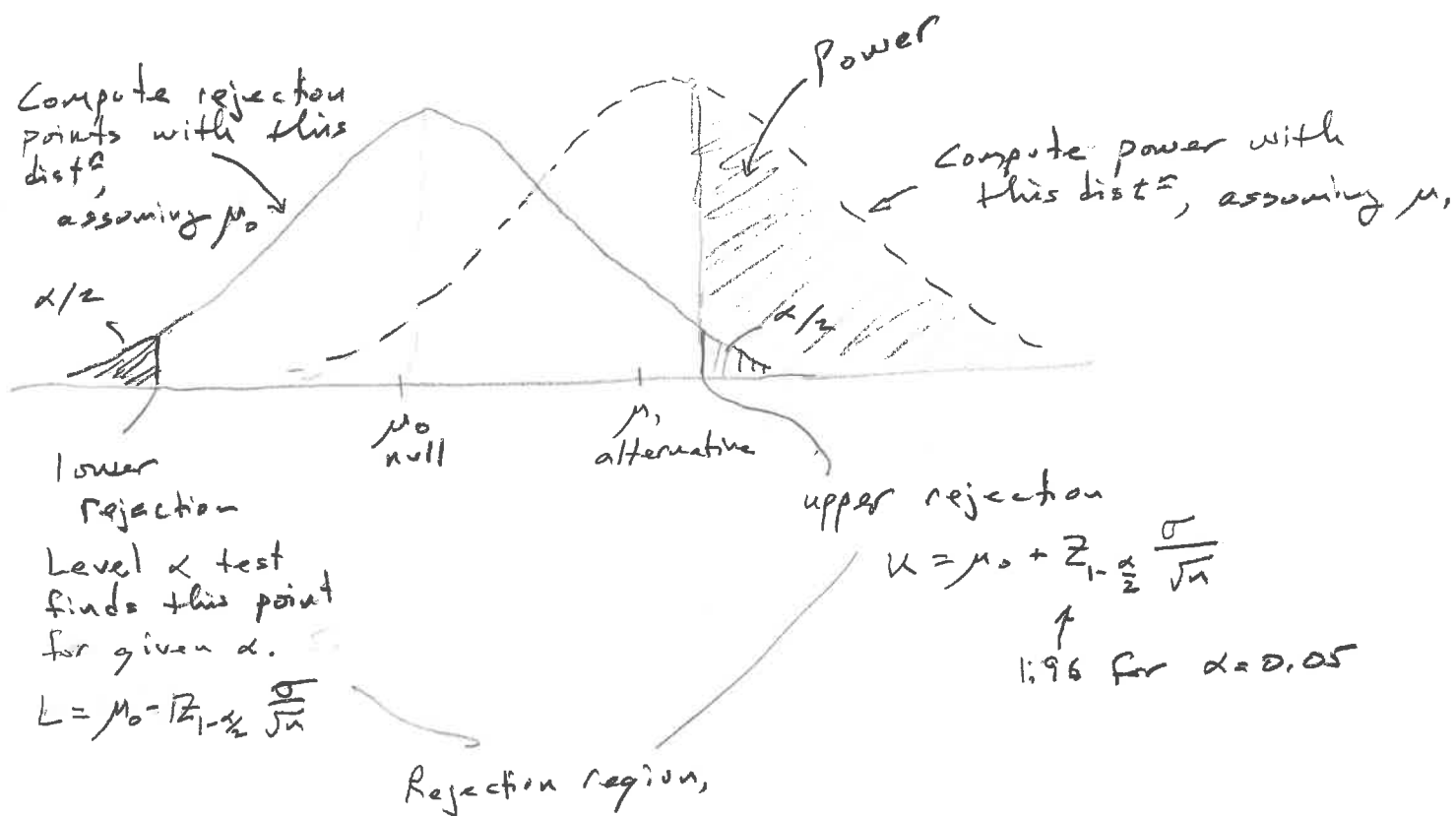
$$\text{Power} = Pr\left(\bar{X} > \mu_0 + Z_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}} \,\Big|\, \mu = \mu_1\right) +$$

$$+ Pr\left(\bar{X} < \mu_0 - Z_{1-\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}} \,\Big|\, \mu = \mu_1\right) \quad \leftarrow \text{ very small, ignore}$$