

Example 1: (one tailed z-test)

The population of all verbal GRE scores are known to have a standard deviation of 8.5. The UW Psychology department hopes to receive applicants with a verbal GRE scores over 210. This year, the mean verbal GRE scores for the 42 applicants was 212.79. Using a value of $\alpha = 0.05$ is this new mean significantly greater than the desired mean of 210?

$$H_0: \mu_x = 210$$

$$\bar{x} = 212.79 \quad n = 42$$

← 210 = μ_{hyp}

$$H_A: \mu_x > 210$$

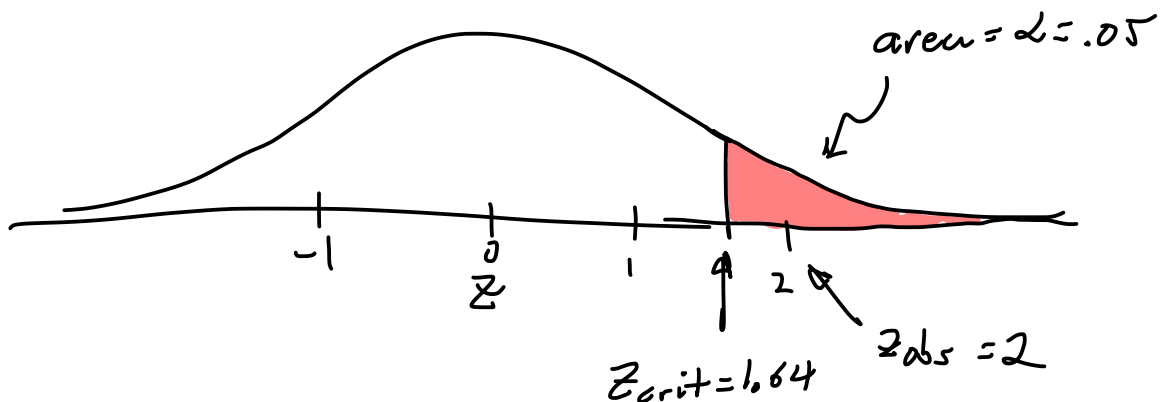
our p-value is $Pr(\bar{x} > 212.79)$ assuming that H_0 is true

$$\mu_{\bar{x}} = 210$$

$$\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{n}} = \frac{8.5}{\sqrt{42}} = 1.31$$

$$z_{obs} = \frac{(\bar{x} - \mu_{hyp})}{\sigma_{\bar{x}}} = \frac{(212.79 - 210)}{1.31} = 2.13$$

We will reject H_0 if $Pr(Z > 2.13) < .05$



$$z_{obs} > z_{crit}$$
$$2 > 1.64$$

Decision: Reject H_0 . The mean GRE score of 212.79 is significantly greater than 210.

$$p\text{-value } Pr(Z_{obs}) = \underline{.0166}$$