

Section 7.2: cont'd

Monday, March 12, 2018 8:33 AM

handout question #2:

$$H_0: \mu_1 - \mu_2 = 0$$

($\mu_1 = \mu_2 \rightarrow$ same)

$$H_a: \mu_1 - \mu_2 \neq 0$$

($\mu_1 \neq \mu_2 \rightarrow$ different)

test statistic:

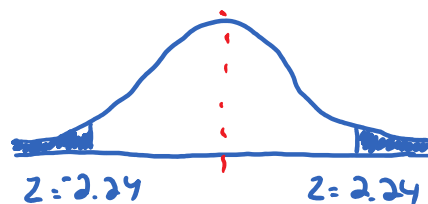
$$Z = \frac{\bar{x}_1 - \bar{x}_2 - D_0}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$= \frac{59 - 60}{\sqrt{\frac{2^2}{40} + \frac{2^2}{40}}}$$

$$= -2.236$$

note: we don't have σ_1 and σ_2 but large sample so can use s_1 and s_2 instead

acceptance/rejection:



Area
= 0.4875

two-tailed because

$$\mu_1 - \mu_2 \neq 0$$

↑
either above 0
or below is okay

$$P(Z < -2.24 \text{ or } Z > 2.24) = 2(0.5 - 0.4875)$$

$$P(Z < -2.24 \text{ or } Z > 2.24) = 2(0.5 - 0.4875) \\ = 0.025$$

conclusion: The difference in fuel efficiency between the Prius and Smart Car is significant ($p = 0.025$)