§6.4

#12 Given: $c = 0.98$, $\Delta = 278.1$, $n = 41$

$n = 41 \rightarrow$ d.f. $= 40$

$\dfrac{1-c}{2} = 0.01 \xrightarrow{\text{table}} \chi^2_R = 63.691$

$\dfrac{1+c}{2} = 0.99 \xrightarrow{\text{table}} \chi^2_L = 22.164$

Confidence interval is

$$\frac{(40)(278.1)^2}{63.691} < \sigma^2 < \frac{(40)(278.1)^2}{22.164}$$

a) $48571.766 < \sigma^2 < 139576.989$

$\downarrow \sqrt{\ } \quad \downarrow \quad \sqrt{\ } \downarrow$

b) $220.390 < \sigma < 373.600$

§7.1

#39 $H_0: \sigma \geq 2.1$

$H_a: \sigma < 2.1 \rightarrow$ right tailed

§7.2

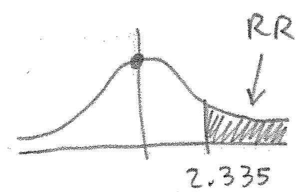
#31 Given data: $n = 50$, $\bar{x} = 31$, $\sigma = 2.5$, $\alpha = 0.01$

$H_0: \mu \leq 30$

claim $\rightarrow H_a: \mu > 30 \rightarrow$ right tailed

reverse look up

$1 - \alpha = 0.99$



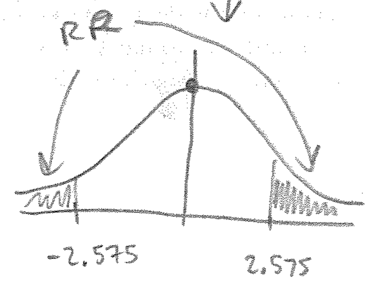
$$z = \frac{\bar{x} - \mu}{\sigma/\sqrt{n}} = \frac{31 - 30}{2.5/\sqrt{50}} \approx 2.828 \longrightarrow \text{in RR}$$

We reject Ho, meaning that there is evidence to support the claim.

#37 Given data: $n=20$, $\bar{x}=39.2$, $\sigma=7.5$, $\alpha=0.01$

claim → $H_0: \mu = 40$

$H_a: \mu \neq 40$ → two-tailed → use $\frac{\alpha}{2} = 0.005$



test statistic:

$$z = \frac{\bar{x}-\mu}{\sigma/\sqrt{n}} = \frac{39.2-40}{7.5/\sqrt{20}} \approx -0.477 \rightarrow \text{not in RR}$$

We fail to reject Ho, meaning there is evidence in support of the claim.