Math 3070-1, Fall 2009
Solutions to Homework 8

7.8. (a) Here, $\alpha = 0.05$; therefore, $z(\alpha/2) = 1.96$, whence the 95% CI for μ is

$$148.30 \pm 1.96\frac{4}{\sqrt{25}} = (146.732\,, 149.868).$$

(b) Because $t_{24}(0.025) = 2.064$, the 95% CI for μ is

$$148.30 \pm 2.064\frac{4}{\sqrt{25}} = (146.6488\,, 149.9512).$$

7.10. Because $\alpha = 0.1$,

$$\chi^2_{n-1}(\alpha/2) = \chi^2_5(0.05) = 11.07 \quad \text{and} \quad \chi^2_{n-1}(1-(\alpha/2)) = \chi^2_5(0.95) = 1.145;$$

now we can apply (7.30) on page 302 to obtain the following 90% CI for σ^2:

$$\left(\frac{5 \times 51.2}{11.07}\,,\ \frac{5 \times 51.2}{1.145}\right) \simeq (23.1256\,, 223.5808).$$