## problem 4

*Exercise 4 a, d, e on page 390.*

$$\left(\bar{X} - z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}} \ , \ \bar{X} + z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}\right)$$

**a)**

$$z_{.95/2} = \Phi((1 - .95)/2) = 1.96$$

$$\left(58.3 - 1.96 \cdot \frac{3.0}{\sqrt{25}} \ , \ 58.3 + 1.96 \cdot \frac{3.0}{\sqrt{25}}\right)$$

$$(57.1, 59.5)$$

**d)**

$$z_{.82/2} = \Phi((1 - .82)/2) = 1.34$$

$$\left(58.3 - 1.34 \cdot \frac{3.0}{\sqrt{100}} \ , \ 58.3 + 1.34 \cdot \frac{3.0}{\sqrt{100}}\right)$$

$$(57.9, 58.7)$$

**e)**

The sample size would need to be 240.

$$n = \left(2z_{\alpha/2} \cdot \frac{\sigma}{w}\right)^2$$

$$z_{.99/2} = \Phi((1 - .99)/2) = 1.34 = 2.58$$

$$n = \left(2 \times 2.58 \times \frac{3.0}{1.0}\right)^2 = 239.6$$