

Q4 (Ex 23, pg 400)

STAT 3093, ASS#4  
ALBERT LOCKETT  
3254354, K44IF@UNB.CA

$$a) \hat{p} \pm z_{\alpha/2} \sqrt{\hat{p}(1-\hat{p})/n}$$

$$\hat{p} = \frac{x}{n} = \frac{24}{37} = 0.65 \quad \alpha = 0.1 \Rightarrow z_{\alpha/2} = -1.65$$

$$0.65 + \sqrt{\frac{0.65(1-0.65)}{37}} = 0.73$$

$$0.65 - \sqrt{\frac{0.65(1-0.65)}{37}} = 0.57$$

The 90% CI for  $p$  is (0.57, 0.73)

$$b) \text{ width } w = 2z_{\alpha/2} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \Rightarrow n = \frac{4\hat{p}(1-\hat{p})z_{\alpha/2}^2}{w^2}$$

$$n = \frac{4\left(\frac{24}{37}\right)\left(1-\frac{24}{37}\right)(-1.65)^2}{0.1^2} = 248.19$$

The sample size would need to be  
at least 249.