MA 381 HW 15 Solutions

#4 $100(1-\alpha)\% = 80\% \Rightarrow \alpha = 0.2$

$\alpha/2 = 0.1$

$\Phi(-z_{\alpha/2}) = 0.1 \Rightarrow -z_{\alpha/2} = -1.28$

$\Rightarrow \boxed{z_{\alpha/2} = 1.28}$

#5 $\hat{p} = 0.61 \quad n = 600$

$n\hat{p} \geq 5$? $n\hat{p} = 366$ ✓

$n(1-\hat{p}) \geq 5$? $n(1-\hat{p}) = 234$ ✓

$$\hat{\sigma}_{\hat{p}} = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = \sqrt{\frac{.61(1-.61)}{600}} = .02$$

$z_{\alpha/2} = 1.960$ for 95% confidence

$\therefore$ 95% CI $\left(\hat{p} - z_{\alpha/2}\hat{\sigma}_{\hat{p}},\ \hat{p} + z_{\alpha/2}\hat{\sigma}_{\hat{p}}\right)$

$= \left(.61 - 1.96(.02),\ .61 + 1.96(.02)\right)$

$= \underline{(.57, .65)}$