

$$2. H_0: p = 0.30$$

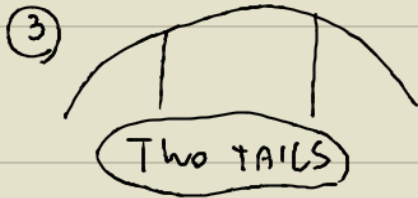
$$H_1: p \neq 0.30$$

$$n = 500$$

$$X = 170$$

$$\alpha = .01$$

$$p = .34$$



$$(4) Z_{AL} = \text{InvNorm}(.01/2) = -2.576$$

$$Z_{AR} = \text{InvNorm}(1 - .01/2) = 2.576$$

$$(5) \hat{p}_L = p_0 + Z_{AL} \sqrt{\frac{p_0(1-p_0)}{n}}$$

$$= .30 - 2.576 \sqrt{\frac{.30(1-.30)}{500}}$$

$$\hat{p}_L = 0.247$$

$$\hat{p}_R = p_0 + Z_{AR} \sqrt{\frac{p_0(1-p_0)}{n}}$$

$$\hat{p}_R = .30 + 2.576 \sqrt{\frac{.30(1-.30)}{500}}$$

$$\hat{p}_R = 0.353$$

$$(6) Z_L = \frac{\hat{p}_L - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{.247 - .34}{\sqrt{\frac{.34(1-.34)}{500}}}$$

$$Z_L = -4.39$$

$$Z_R = \frac{\hat{p}_R - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{.353 - .34}{\sqrt{\frac{.34(1-.34)}{500}}}$$

$$= 0.61$$

$$(7) \beta = \text{NormalCDF}(Z_L, Z_R)$$

$$= \text{NormalCDF}(-4.39, 0.61)$$

$$\beta = .7291$$

$$(8) \text{Power} = 1 - \beta = 1 - .7291 = .2709$$

$$2. H_0: p = 0.30$$


$$H_1: p \neq 0.30$$

$$n = 500$$

$$X = 170$$

$$\alpha = .01$$

$$p = .34$$

(3) Two tails 

$$(4) Z_{AL} = -2.575$$

$$Z_{AR} = 2.575$$

$$(5) \hat{p}_L = p_0 + Z_{AL} \sqrt{\frac{p_0(1-p_0)}{n}}$$

$$= 0.30 - 2.575 \sqrt{\frac{.30(1-.30)}{500}}$$

$$\hat{p}_L = 0.247$$

$$\hat{p}_R = p_0 + Z_{AR} \sqrt{\frac{p_0(1-p_0)}{n}}$$

$$\hat{p}_R = 0.30 + 2.575 \sqrt{\frac{.30(1-.30)}{500}}$$

$$\hat{p}_R = 0.353$$

$$(6) Z_L = \frac{\hat{p}_L - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{.247 - .34}{\sqrt{\frac{.34(1-.34)}{500}}}$$

$$Z_L = -4.39$$

$$Z_R = \frac{\hat{p}_R - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{.353 - .34}{\sqrt{\frac{.34(1-.34)}{500}}}$$

$$= 0.61$$

$$(7) Z_L = -4.39 \quad Z_R = 0.61$$

$$.0002$$

$$0.7291$$

$$\beta = 0.7291 - 0.0002$$

$$\beta = 0.7289$$

$$(8) \text{Power} = 1 - \beta = 1 - .7289 = .2711$$