

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

$$z^* = \frac{\hat{p}^* - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

$$\hat{p}^* - p_0 = z^* \sqrt{\frac{p_0(1-p_0)}{n}}$$

$$\hat{p}^* = z^* \sqrt{\frac{p_0(1-p_0)}{n}} + p_0$$