§ 8.7 ESTIMATING THE DIFFERENCE BETWEEN TWO $\underbrace{\text{BINOMIAL PROPORTIONS}}_{\left(\hat{p} = \frac{x}{n}\right)}$

ESSENTIALLY THE SAME

SAMPLING DISTRIBUTION OF $(\hat{p}_1 - \hat{p}_2)$ HAS

- MEAN $= (p_1 - p_2)$
- S.E. $= \sqrt{\dfrac{p_1 q_1}{n_1} + \dfrac{p_2 q_2}{n_2}} \approx \sqrt{\dfrac{\hat{p}_1 \hat{q}_1}{n_1} + \dfrac{\hat{p}_2 \hat{q}_2}{n_2}}$

THE SAMPLING DISTRIBUTION FOR $(\hat{p}_1 - \hat{p}_2)$ IS APPROXIMATELY NORMALLY DISTRIBUTED IF

$n_1 \hat{p}_1 > 5$ & $n_2 \hat{p}_2 > 5$

$n_1 \hat{q}_1 > 5$ & $n_2 \hat{q}_2 > 5$

POINT ESTIMATION: $(p_1 - p_2) \approx (\hat{p}_1 - \hat{p}_2)$

95% MARGIN OF ERROR: ± 1.96 S.E.

$(1 - \alpha)$ CONFINDENCE INTERVAL:

$$(\hat{p}_1 - \hat{p}_2) \pm z_{\alpha/2} \text{ S.E.}$$

ex. # 55, 65