

P. 228.

ex 7.

$$(1) \quad \hat{p} = \frac{45}{80} = 0.56$$

(3)

$$Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = 0.56 \pm Z_{0.05} \sqrt{\frac{0.56(0.44)}{80}}$$

$$= 0.56 \pm 1.645 \times 0.06$$

$$= 0.56 \pm 0.1 \Rightarrow \underline{(0.46, 0.66)} \quad \checkmark$$

(2)

$$Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = Z_{0.025} \sqrt{\frac{0.56(0.44)}{80}}$$

$$= 1.96 \times 0.06$$

$$= 0.12$$

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ex 21.

$$(1) \hat{p} = \frac{105}{250} = 0.42$$

$$0.42 \pm Z_{0.05} \sqrt{\frac{0.42(0.58)}{250}}$$

$$= 0.42 \pm 1.645 \times 0.03$$

$$= 0.42 \pm 0.05$$

$$\Rightarrow (0.37, 0.47)$$

$$(c) \hat{p} = 0.5$$

$$n = \left( \frac{1.96}{0.03} \right)^2 \times 0.5 \times 0.5$$

$$= 1067.1 \doteq 1068$$

(2)

$$(a) \hat{p} = 0.3, e = 0.03, 1 - \alpha = 0.95$$

$$e = \frac{\sigma}{\sqrt{n}} \times Z$$

$$n = \left( \frac{Z}{e} \right)^2 \times \hat{p} \times (1 - \hat{p})$$

$$n = \left( \frac{1.96}{0.03} \right)^2 \times 0.3 \times 0.7$$

$$= 896.37 \doteq 897$$

$$(b) \hat{p} = 0.42$$

$$n = \left( \frac{1.96}{0.03} \right)^2 \times 0.42 \times 0.58$$

$$= 1039.79 \doteq 1040$$

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ex 8.

$$\hat{p} = 0.55, \quad \hat{p}_2 = 0.6$$

$$(\hat{p} - \hat{p}_2) \pm Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$

$$= (0.55 - 0.6) \pm Z_{0.025} \sqrt{\frac{0.55(0.45)}{100} + \frac{0.6 \times 0.4}{100}}$$

$$= -0.05 \pm 1.96 \times 0.07$$

$$= -0.05 \pm 0.14$$

$$\Rightarrow (-0.19, 0.09)$$

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