

$$1. (1) t_{0.025}(10) = 2.228$$

$$(2) t_{0.95}(8) = -1.86$$

$$(3) \chi_{0.05}^2(12) = 21.026$$

$$(4) \chi_{\alpha}^2(15) = 7.26, \alpha = 0.95$$

$$(5) \chi_{0.95}^2(12) = 3.570$$

$$(6) F_{0.05}(5,8) = 3.69$$

$$(7) F_{0.95}(6,7) = \frac{1}{F_{0.05}(7,6)} = \frac{1}{4.2} = 0.238$$

$$(8) F_{\alpha}(6,6) = 4.28, \alpha = 0.05$$

$$7. (1) \hat{p} = \frac{45}{80} = 0.56$$

$$(2) z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = z_{0.05} \sqrt{\frac{0.56 \times 0.44}{80}} = 1.96 \times 0.06 = 0.12$$

$$(3) \hat{p} \pm z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = 0.56 \pm 0.05 \sqrt{\frac{0.56 \times 0.44}{80}} = 0.56 \pm 1.645 \times 0.06 \Rightarrow (0.46, 0.66)$$

$$8. \hat{p}_1 = 0.55, \hat{p}_2 = 0.6$$

$$(\hat{p}_1 - \hat{p}_2) \pm z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}} = (0.55 - 0.6) \pm z_{0.05} \sqrt{\frac{0.55 \times 0.45}{100} + \frac{0.6 \times 0.4}{100}} = -0.05 \pm 0.14 \Rightarrow (-0.19, 0.09)$$

$$21. (1) \hat{p} = \frac{105}{250} = 0.42, 0.42 \pm z_{0.05} \sqrt{\frac{0.42 \times 0.58}{250}} = 0.42 \pm 1.645 \times 0.03 \Rightarrow (0.37, 0.47)$$

$$(2) (a) \hat{p} = 0.3, e = 0.03, 1 - \alpha = 0.95, e = \frac{z}{\sqrt{n}} \times z, n = \left(\frac{z}{e}\right)^2 \times \hat{p}(1-\hat{p})$$

$$n = \left(\frac{1.96}{0.03}\right)^2 \times 0.3 \times 0.7 = 896.37 \approx 897$$

$$(b) \hat{p} = 0.42, n = \left(\frac{1.96}{0.03}\right)^2 \times 0.42 \times 0.58 \approx 1040$$

$$(c) \hat{p} = 0.5, n = \left(\frac{1.96}{0.03}\right)^2 \times 0.5 \times 0.5 \approx 1068$$

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$$2. e = \frac{\sigma}{\sqrt{n}} \times Z_{\frac{\alpha}{2}}$$

$$(1) \sigma = 3, e = 0.5, 1 - \alpha = 0.95$$

$$n = \left(\frac{3}{0.5}\right)^2 \times 1.96^2 \approx 139$$

$$(2) \sigma = 0.2, e = 0.03, 1 - \alpha = 0.9$$

$$n = \left(\frac{0.2}{0.03}\right)^2 \times 1.645^2 \approx 121$$

$$(3) \sigma = 0.05, e = 0.02, 1 - \alpha = 0.98$$

$$n = \left(\frac{0.05}{0.02}\right)^2 \times 2.326^2 \approx 34$$

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