Homework Solutions
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Exercise 22

(a) The point estimate is $\hat{p} = \frac{20}{280} = 0.07143$. The 90% confidence interval for p is

$$\begin{aligned}\hat{p} \pm z\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} &= 0.07143 \pm 1.645\sqrt{\frac{(0.07143)(0.92857)}{280}} \\ &= 0.07143 \pm 0.01517.\end{aligned}$$

(b) The 95% confidence interval for p is

$$\begin{aligned}\hat{p} \pm z\sqrt{\frac{\hat{p}(1-\hat{p})}{n}} &= 0.07143 \pm 1.960\sqrt{\frac{(0.07143)(0.92857)}{780}} \\ &= 0.07143 \pm 0.01807.\end{aligned}$$

(c) (b) is wider. That is why we are more confident that it contains p.