Solutions

Each answer shows the steps, then the **result**.

2.1

- $\hat{p} \pm z^* \sqrt{\dfrac{\hat{p}(1-\hat{p})}{n}}$

2.2

- 1.96

2.3

- $\text{ME} = 1.96\sqrt{\dfrac{0.5(0.5)}{100}} = 1.96(0.05) = 0.098$

3.1 A

- $\hat{p} \pm \text{ME}$.

3.2 C

- 1.96.

3.3

(a)

- $\text{ME} = 1.96\sqrt{\dfrac{0.4(0.6)}{100}} = 1.96(0.049) = 0.096$

(b)

- $(0.304,\ 0.496)$

3.4

(a)

- Random: the students were a random sample
- 10%: $n = 80 \le 0.10(1{,}200) = 120$, so sampling without replacement is fine
- Large counts: $n\hat{p} = 52 \ge 10$ and $n(1-\hat{p}) = 28 \ge 10$

(b)

- $\hat{p} = \dfrac{52}{80} = 0.65$; one-sample z interval $\hat{p} \pm z^* \sqrt{\dfrac{\hat{p}(1-\hat{p})}{n}}$:

$$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = 0.65 \pm 1.96\sqrt{\frac{(0.65)(0.35)}{80}}$$

- $= 0.65 \pm 1.96(0.0533) = 0.65 \pm 0.105$
- interval (**0.546**, **0.754**)

(c)

- yes: every value in the interval is above 0.5, so a majority is plausible and 0.5 or below is not