

60080079 Introduction to Statistical Methods
Semester 2 2023-2024
Solutions 7

1. Write your answer as a two-digit number. **32**

1.1. The sample proportion is $\hat{p} = \sum x / n = 421 / 500 = 0.8420$, with

$$SE(\hat{p}) = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = \sqrt{\frac{0.8420(1-0.8420)}{500}} = 0.0163.$$

1.2. The 90% interval for p is

$$\hat{p} \pm 1.645 \times SE(\hat{p}) = 0.8420 \pm 1.645 \times 0.0163 = 0.842 \pm 0.0268 = (0.8151, 0.8688)$$

2. Write your answer as a two-digit number. **12**

With $\hat{p} = 0.5830$, $SE(\hat{p}) = 0.0302$, and the 95% confidence interval is (0.5237, 0.6423).

3. Write your answer as a three-digit number. **342**

Using \hat{p} , the sample proportion, $\hat{p} = \sum x / n = 524 / 1711 = 0.3168$, with

$$SE(\hat{p}) = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = \sqrt{\frac{0.3168(1-0.3168)}{1711}} = 0.01125$$

The 99% confidence interval for p is

$$\hat{p} \pm 2.576 \times SE(\hat{p}) = 0.3168 \pm 2.576 \times 0.01125 = 0.3168 \pm 0.0290 = (0.2878, 0.3457)$$

4. PART I: Write your answer as a three-digit number. **232**

PART II: Write your answer as a three-digit number. **143**

Computing the standard error without knowing anything about the population proportion,

$$SE(\hat{p}) = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = \sqrt{\frac{0.7(1-.3)}{40}} = 0.0725$$

The 95% interval is 0.5580 to 0.8420.

5. PART I: Write your answer as a two-digit number. **31**

PART II: Write your answer as a two-digit number. **23**

PART III: Write your answer as a three-digit number. **416**

5.4. We find $\hat{p} = \frac{63 + 27}{296 + 251} = 0.1645$, we find $SE(\hat{p}_f - \hat{p}_m) = 0.0318$,

5.5. $Z = \frac{\hat{p}_f - \hat{p}_m}{SE(\hat{p}_f - \hat{p}_m)} = 3.31$. This gives a p-value of .0010 --a significant evidence that women

are more likely than men to be label users.