

## Question 6

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In a USA Today/Gallup Poll, 768 of 1024 randomly selected American adults (aged 18 or older) state that a candidate's position on 'family values' is very important in determining their vote for president.

Estimate, with 95% confidence, the proportion of all American adults that state that a candidate's position on 'family values' is very important in determining their vote for president.

1. Pick the multiple-choice response that represents the 95% confidence interval.
2. On a separate document, indicate what technology you used, paste the output and interpret the confidence interval in the context of the problem (as demonstrated in the notes).

### Interpretation for a 1-Sample Proportion Confidence Interval

We determined on the Work tab that the 95% confidence interval for the proportion was:

$$\pi \in (0.7235, 0.7765)$$

Now we can interpret the interval as follows:

We are 95% confident that the true proportion is between 0.7235 and 0.7765

I used StatHelper.

I am 95% confident that between 72.35% and 77.65% of American adults find a candidates position on "family values" important.

3. Show your work as you check if the normality assumption has been met.

$$\begin{aligned} (n)\hat{p}(1 - \hat{p}) &\geq 10 \\ (1024)(0.75)(1 - 0.75) &\geq 10 \\ 192 &\geq 10 \end{aligned} \tag{1}$$

This set of data can be considered normal.

## Question 9

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I was unable to find how to calculate this in the notes.

## Question 10

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See response to question 9.

# Question 11

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XYZ Fasteners manufactures three-inch nails. If a nail is not straight, then it is considered defective. In a recent sample of 500 nails, 15 were determined to be defective.

1. Estimate, with 95% confidence, the true proportion of three-inch nails that are defective. Show your technology output and interpret the interval in the context of the problem.

## Interpretation for a 1-Sample Proportion Confidence Interval

We determined on the Work tab that the 95% confidence interval for the proportion was:

$$\pi \in (0.015, 0.045)$$

Between 1.5% and 4.5% of nails are defective.

2. What is the point estimate for the true proportion of three-inch nails that are defective for this sample?

$$\hat{p} = 0.03$$

3. What is the margin of error for this interval?

$$ME = 0.015$$

4. XYZ Fasteners claims that no more than 3% of the nails it produces are defective. Does the CI support this statement? Explain your answer.

The CI does not support this statement, as the entire CI is not below 3%.

5. An industry review claims that the defective rate for nail production is expected to be 2%. Does the CI support this statement? Explain your answer.

The CI does not support this statement either, as the entire CI is not above 2%.

# Question 12

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New York State consumers can purchase non-prescription medications at food stores, mass merchandise stores (such as Walmart), or pharmacies. A recent study asked a random sample of NYS consumers whether they buy their non-prescription medications at a pharmacy. Of the 105 people polled, 47 indicated they buy their non-prescription medicines at a pharmacy.

1. Estimate, with 95% confidence, the proportion of all NYS consumers that buy their non-prescription medicines at a pharmacy. Interpret the CI and check if the normality assumption has been met (show work).

## Interpretation for a 1-Sample Proportion Confidence Interval

We determined on the Work tab that the 95% confidence interval for the proportion was:

$$\pi \in (0.3525, 0.5427)$$

$$\begin{aligned}(n)\hat{p}(1 - \hat{p}) &\geq 10 && (2) \\ (105)(0.4476)(1 - 0.4476) &\geq 10 \\ 26 &\geq 10\end{aligned}$$

Between 35.25% and 54.27% of NYS consumers buy their non-prescription medicines at a pharmacy.

2. A pharmacy publication stated that at least 40% of NYS consumers use the pharmacy for non-prescription items. Does the CI support this statement? Explain.  
The CI does not support this statement, because the entire CI is not above 40%.
3. Your colleague wants to report that a **majority** of NYS consumers use the pharmacy for non-prescription items. Does the CI support this statement? Explain.  
The CI does not support this statement either, because the entire CI is not above 50%.
4. Your department settles on the following statement: 50% of NYS consumers use the pharmacy for non-prescription items. Does the CI support this statement? Explain.  
The CI does support this statement because 50% is within the CI.