

## 9.5.1: Confidence Interval- Place of Birth (Worksheet)

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Student ID#: \_\_\_\_\_

*Work in groups on these problems. You should try to answer the questions without referring to your textbook. If you get stuck, try asking another group for help.*

### 9.5.1.1 - Student Learning Outcomes

- The student will calculate the 90% confidence interval the proportion of students in this school who were born in this state.
- The student will interpret confidence intervals.
- The student will determine the effects of changing conditions on the confidence interval.

### 9.5.1.2 - Collect the Data

- Survey the students in your class, asking them if they were born in this state. Let  $X$  = the number that were born in this state.
  - $n$  = \_\_\_\_\_
  - $x$  = \_\_\_\_\_
- In words, define the random variable  $P'$ .
- State the estimated distribution to use.

### 9.5.1.3 - Find the Confidence Interval and Error Bound

- Calculate the confidence interval and the error bound.
  - Confidence Interval: \_\_\_\_\_
  - Error Bound: \_\_\_\_\_
- How much area is in both tails (combined)?  $\alpha$  = \_\_\_\_\_
- How much area is in each tail?  $\frac{\alpha}{2}$  = \_\_\_\_\_
- Fill in the blanks on the graph with the area in each section. Then, fill in the number line with the upper and lower limits of the confidence interval and the sample proportion. <figure >

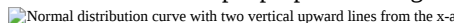
 Normal distribution curve with two vertical upward lines from the x-axis to the curve. The confidence interval is between these two lines. The residual areas are on either side.

Figure 8.6.1.

### 9.5.1.4 - Describe the Confidence Interval

- In two to three complete sentences, explain what a confidence interval means (in general), as though you were talking to someone who has not taken statistics.
- In one to two complete sentences, explain what this confidence interval means for this particular study.
- Construct a confidence interval for each confidence level given.

Confidence level	EBP/Error Bound	Confidence Interval
50%		
80%		
95%		
99%		

- What happens to the  $EBP$  as the confidence level increases? Does the width of the confidence interval increase or decrease? Explain why this happens.

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