

## Unit 1 Quiz: Confidence Intervals for Proportions – B

Name(s): \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Date: \_\_\_\_\_ Period: \_\_\_\_\_

**\*\*Show and label all work for each problem**

**to receive credit. Keep 4 decimals.\*\***

**Confidence Interval:**  $\hat{p} \pm E$  where  $E = z^* \sqrt{\frac{pq}{n}}$

Level of confidence	Critical Value, $z^*$
90%	1.645
95%	1.96
99%	2.575

- 1.) A car dealership wants to do a customer satisfaction survey to predict the number of people who are happy with their service department. 50 customers are asked their opinion of the service department and 28 were satisfied, 17 were dissatisfied, and 5 had no opinion. Construct and interpret a 95% confidence interval for the true proportion of customers *who are satisfied* with the service department at that dealership.

Interpretation: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- 2.) In a nationwide survey of 200 sports fans, 90 listed football as their favorite sport, 50 listed basketball, 40 listed baseball, and 20 listed other sports (soccer, golf, track, etc). Construct and interpret a 99% CI for the true population proportion of sports fans whose favorite sport is basketball.

Interpretation: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

- 3.) Recently, a few Boeing 737 airplanes have had cracks in the fuselage appear during flights. Inspections of 250 planes found cracks beginning in the fuselage in 70 planes. Construct and interpret a 90% confidence interval for the proportion of all planes with cracks in the fuselage.

Interpretation: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**\*\*EXTRA CREDIT\*\***

- A.) **(6 points)** USA Today wants to publish an opinion poll about the percentage of the population which is in favor of lowering taxes for the rich with 95% confidence. The publishers would like the margin of error (aka "Error Estimate") to be no more than 3%. Assuming opinions would be evenly split, what should their sample size be to obtain this margin? Justify your answer with sufficient work.

A.) ANSWER: \_\_\_\_\_

- B.) **(2 points)** Suppose we are planning on taking an SRS from a population. If we triple the sample size, then  $\sigma_{\hat{p}}$  will be multiplied by:

B.) ANSWER: \_\_\_\_\_