

Functions & Trig  
Confidence Interval of Proportions  
Day 2

Name \_\_\_\_\_

1.) Based on a survey of a random sample of 900 adults in the United States, a journalist reports that 60 percent of adults in the United States are in favor of increasing the minimum hourly wage. If the reported percent has a margin of error of 2.7 percentage points, then what percentage is most **unlikely** to occur?

- (A) 58%                      (B) 60%                      (C) 62%                      (D) 64%

$$\hat{p} \pm z^*(S.D.)$$

$$\hat{p} \pm M.E.$$

$$.60 \pm .027$$

$$(.573, .627)$$

outside the interval

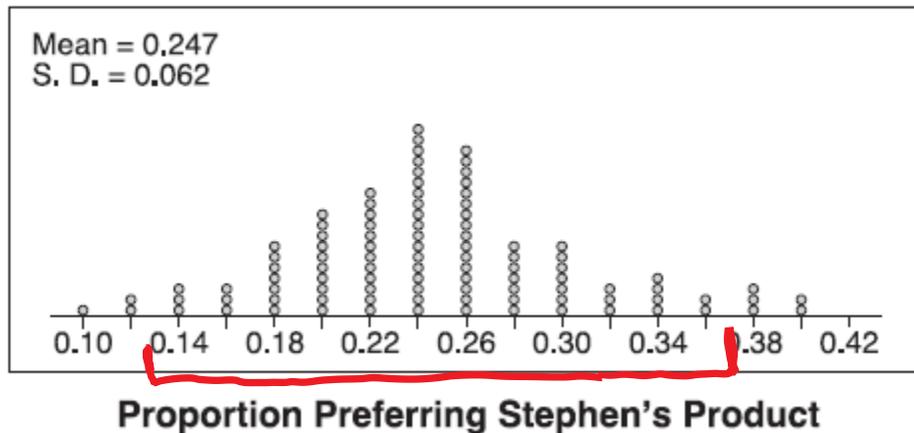
2.) *USA Today* reported that speed skater Bonnie Blair had “won the USA’s heart,” according to a *USA Today/CNN/Gallop Poll* conducted on the final Thursday of the 1994 Winter Olympics. When asked, who was the hero of the Olympics, 65% of the respondents chose Blair, who won five gold medals. The poll of 615 adults, done by telephone, had a margin of error of 4 percent.

$$(.61, .69)$$

Which of the following statements best describes what is meant by the 4 percent margin of error?

- (A) About 4 percent of adults were expected to change their minds between the time of the poll and its publication in *USA Today*.
- (B) About 4 percent of the adults sampled are not representative of the population.
- (C) About 4 percent of the 615 adults polled refused to answer the question.
- (D) The difference between the sample percentage and the population percentage is likely to be less than 4 percent.

3.) Stephen's Beverage Company is considering whether to produce a new brand of cola. The company will launch the product if at least 25% of cola drinkers will buy the product. Fifty cola drinkers are randomly selected to take a blind taste-test of products A, B, and the new product. Nine out of fifty participants preferred Stephen's new cola to products A and B. The company then devised a simulation based on the requirement that 25% of cola drinkers will buy the product. Each dot in the graph shown below represents the proportion of people who preferred Stephen's new product, each of sample size 50, simulated 100 times.



a. Assume the set of data is approximately normal and the company wants to be 95% confident of its results. Determine the confidence interval of this data.

$$\hat{p} \pm z^* (s.d.)$$

$$.247 \pm 2 (.062)$$

$$.247 \pm .124$$

$$(.123, .371)$$

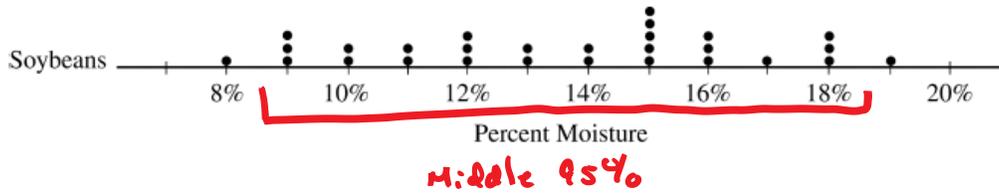
b. Does the sample proportion obtained from the blind taste-test, nine out of fifty, indicate that the Beverage Company should produce the new cola product? **Justify your answer.**

$$\frac{9}{50} \approx .18$$

The .18 is inside the 95% confidence interval this is considered common, so they should produce the new cola.

4.) Grain moisture is a characteristic of grain that affects the price paid for the grain. A random sample of 28 loads of soybeans was evaluated for moisture as a percent of the total weight.

$$28(.95) = 26.6$$



At a 95% confidence level, the point estimate of the percent moisture of Soybeans and the margin of error are closest to

- (a) point estimate  $\approx 15\%$  ; margin of error  $\approx 5\%$  ( .10 , .20 )
- (b) point estimate  $\approx 13.5\%$  ; margin of error  $\approx 5\%$  ( .085 , .185 )
- (c) point estimate  $\approx 5\%$  ; margin of error  $\approx 13.5\%$
- (d) point estimate  $\approx 15\%$  ; margin of error  $\approx 3.5\%$

5.) If a 95% confidence interval is (0.72 , 0.82) what is  $\hat{p} = \underline{.77}$  and M.E. = .05.

↑  
middle