Math 153 - Quiz 10

May 5, 2016

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) A magazine would like to find a 90% confidence interval estimate for the proportion of readers who drive hybrid cars. How many readers should be in the magazine's random sample if a 3.5% margin of error is desired?

$\alpha = 0.10$

$\alpha/2 = 0.05$

$z_{\alpha/2} = \text{invNorm}(0.95)$

≈ 1.645

$$n \approx \frac{(1.645)^2(0.25)}{(0.035)^2} = 552.25$$

Use $n = 553$

2. (3 points) A Gallup Poll of 30,000 employed adults found that 45.2% of them believe they have good jobs. Find a 85% confidence interval for the true population proportion. State your conclusion in a complete sentence.

45.2% of 30,000 = 13560

1-PropZInt

$X = 13560$

$n = 30000$

→ C.I. ESTIMATE IS (0.44786, 0.45614)

WE CAN BE 85% CONFIDENT THAT THE TRUE POPULATION PROPORTION IS BETWEEN 44.8% AND 45.6%.

3. (4 points) A simple random sample of regional gas prices gave the following data:

2.42, 2.29, 2.41, 2.26, 2.53, 2.21, 2.29, 2.42

Assuming that gas prices are normally distributed with a population standard deviation of 10 cents, find a 95% confidence interval estimate for the mean regional gas price. State your conclusion in a complete sentence.

$\sigma = 0.10$

ZInterval

w/ DATA

gives

C.I. ESTIMATE

(2.2845, 2.423)

WE CAN BE 95% THAT THE MEAN REGIONAL GAS PRICE IS BETWEEN $2.28 AND $2.42.