

Quiz 8 (April 26, 2017)

Statistics for Social Science (201-401-DW)

Instructor: Emilie Richer

NAME: SOLUTIONS**[QUESTION 1] (10 MARKS)**

A study examined the time it takes for owners of hybrid vehicles to recoup their initial cost through reduced fuel consumption. Suppose that a random sample of 9 hybrid cars showed a mean time of 2.1 years. Assume that the population is normal with $\sigma = 0.2$. Test using level of significance $\alpha = 0.01$ whether the population mean time it takes owners of hybrid cars to recoup their initial cost is less than three years.

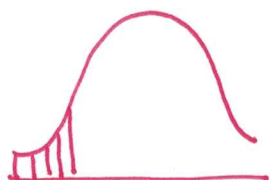
$$H_0: \mu = 3$$

$$H_a: \mu < 3$$

(2)

THE population is ASSUMED TO BE NORMAL
SO WE CAN USE THE Z-TABLE SINCE
 σ IS KNOWN

(2)



$$z = -2.33$$

Rejection REGION $z \leq -2.33$

(1)

$$\text{TEST STATISTIC } z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}} = \frac{2.1 - 3}{0.2 / \sqrt{9}} = -13.5$$

(2)

Reject H_0

THE TIME IT TAKES OWNERS OF
HYBRID CARS TO RECOUP THEIR INITIAL
COSTS IS LESS THAN 3 YEARS

(2)