

**Instructions:** Show all work. Answers without work can only be graded all or nothing. Partial credit is available only when work is shown. Answer all parts of each problem. Provide explanations as indicated. You may use Excel to complete any required statistical calculations or graphs. Submit any Excel work with assignment. Do not say "see Excel" for answers, but write or paste them into this document. Exact answers are preferred unless specifically asked to round.

1. Use the data on Sheet 1 in the data file **245quiz10data.xlsx** to find a 90% confidence interval for the difference of mean times between those with Basic cable and those with Extended cable.

(1.11, 3.56)

*answers may vary slightly if you use pooled or unpooled st. error*

2. Use the data on Sheet 2 to construct a 95% confidence interval for the mean difference of the paired data.

(0.128461, 0.597254)

3. Use the data on Sheet 3 of the same file and Excel to conduct two hypothesis tests. State the null and alternative hypotheses and all major components of your analysis including the conclusion. Separate the data into two groups by marital status. Determine if there is a difference in the proportion of homeownership between married and single households. (Hint: after separating the data into groups by marital status, calculate the proportion of homeownership in each group.)

*proportion test*

$$H_0: p_1 = p_2$$

$$H_a: p_1 \neq p_2$$

$$z = 35.248$$

*p-value = very small  $\approx 0$*

*reject null.*

*homeownership does differ by marital status*

*mean test*

$$H_0: \mu_1 = \mu_2$$

$$H_a: \mu_1 \neq \mu_2$$

$$t = 3.755\dots$$

$$p\text{-value} = 1.736 \times 10^{-4} \ll 0.05$$

*reject null*

*there is a difference between mean # of children on marital status (though the difference is small)*