**AP Statistics Name:  
Special Problem 10 (S-2017)**

**Directions**: Complete the following problems as you would on the AP Exam. Show all your work. Indicate clearly the methods you use, because you will be graded on the correctness of your methods as well as on the accuracy and completeness of your results and explanations. This is an individual effort. You may use the text or your notes but no other outside resources including the internet.

1. It is a common belief that women tend to live longer than men. Random samples from the death records for men and women in Montgomery County, MD were taken, and age at time of death was recorded. The average age of the 48 males was 68.33 years with a standard deviation of 12.49 years, while the average age of 40 females was 78.7 years with a standard deviation of 16./43 years.

a. Do women in this county tend to live longer than men? Give appropriate statistical evidence to support your answer.

b. Construct and interpret a 95% confidence interval for the mean difference in ages between men and women in this survey. You **do not** need to recheck conditions.

2. A researcher wants to know whether there is a difference in AP Statistics exam failure rates between rural and suburban students. She randomly selects 107 rural students and 143 suburban students who took the exam. Thirty rural students failed to pass their exam, while 45 suburban students failed to pass.

a. Is there a significant difference in failures rates between these groups? Give appropriate statistical evidence to support your answer.

b. Given your conclusion in part (a), which type of mistake – Type I or Type II – could you have made? Explain in context.