

Name: \_\_\_\_\_

**CHE384 Data to Decisions**  
**Fall, 2018, Chris A. Mack**

**Exam #1 – In Class Portion (25%)**

open book, open notes, calculators and laptops allowed

1) Use your OLS model to predict the boiling point of water when the barometric pressure is 15 inches of mercury. Provide a 95% confidence interval for this prediction (the formula below can be used).

$$s_{\hat{y}_i}^2 = \frac{[SE(e)]^2}{n} + [SE(b_1)]^2(x_i - \bar{x})^2$$

2) Explain the difference between an internally studentized residual (isr) and an externally studentized residual (esr). Why would one choose to use an esr instead of an isr for analysis?

3) Why is it important to deal with outliers before testing for normality (using skewness and kurtosis tests, for example)?

4) What two properties do you look for in a “best fit” estimate of a model parameter?

5) Explain what the hat matrix is used for.

6) Explain what is meant by a regression result that is “fragile”.

7) In this problem, one could use  $1/T$  as the regressor (x) variable and  $\ln(P)$  as the output (y) variable, or the other way around (modeling  $1/T$  as a function of  $\ln(P)$ ). Is there any difference between these two approaches? Would you expect to get different results? Why?