Stat 205 Homework 4

Answer all questions **on one side of the same sheet of paper**.

1. Page 214: Problems 6.S.2(b,c) and 6.S.3(a,b). The data are

   ```
   stem=c(2.3,2.6,2.4,2.2,2.3,2.5,1.9,2.0)
   ```

   For 6.S.2(b) use `t.test(stem)`; for 6.S.3(b) use `qqnorm(stem)`.

2. Soap manufacturers sell special "antibacerial" soaps. However, ordinary soap might also kill bacteria. A researcher placed ordinary soap (treatment) onto $n_1 = 7$ petri dishes and sterile water (control) on $n_2 = 8$ other perti dishes; *E. Coli* was added to all petri dishes. After 24 hours the number of bacterial colonies was counted on each dish. The data, given in Problem 6.6.9 (p. 205), are

   ```
   control=c(30,36,66,21,63,38,35,45)
   soap=c(76,27,16,30,26,46,6)
   ```

   (a) In R, obtain normal probability plots from each group – treatment and contol – and comment on whether we can assume the data are normal in each group; e.g. `qqnorm(control)` and `qqnorm(soap)`. Include the plots in your writeup.

   (b) In R, obtain a 95% confidence interval for the difference in mean number of bacerial colonies $\mu_1 - \mu_2$ in soap vs. no-soap. Include the R output in your writeup (just the portion that reports the cinfidence interval). You will use something like `t.test(soap,control)`.

   (c) Interpret the confidence interval, i.e. write "With 95% confidence, the true mean difference in soap vs. no-soap bacterial colony counts are..."