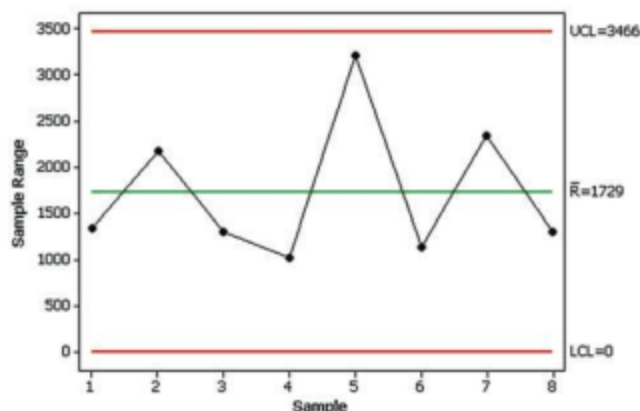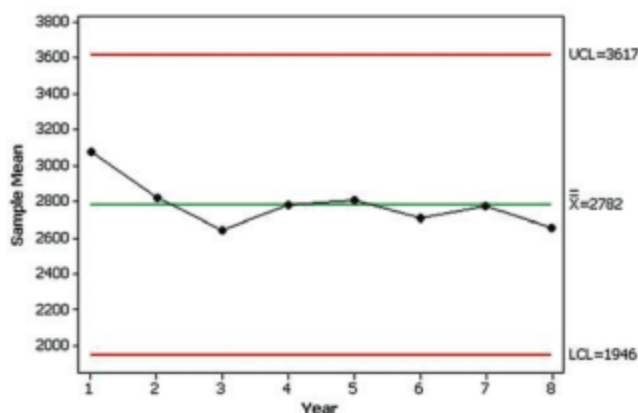2. The process variation is within statistical control.


3. The process mean is within statistical control.

4. There does not appear to be a pattern suggesting that the process is not within statistical control. There is 1 point that appears to be exceptionally low. (The author's power company made an error in recording and reporting the energy consumption for that time period.)
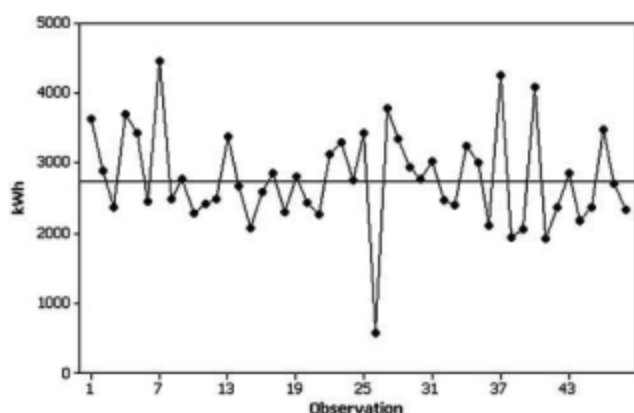
5. Because there are 8 consecutive points above the centerline and there is an upward trend, the process does not appear to be within statistical control.
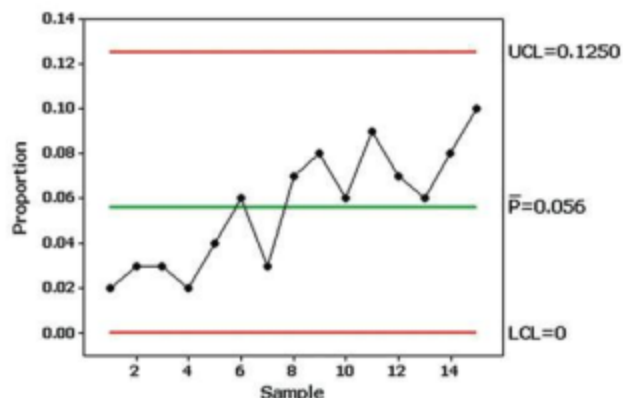
Chapter 14: Cumulative Review Exercises

1. $0.519 < p < 0.581$. Because all of the values in the confidence interval estimate of the population proportion are greater than 0.5, it does appear that the majority of adults believe that it is not appropriate to wear shorts at work.

2. a. 0.45   b. 0.0503   c. 0.950

3. $r = 0.820$. Critical values: $r = \pm 0.602$. P-value $= 0.00202$. There is sufficient evidence to support the claim that there is a linear correlation between yields from regular seed and kiln-dried seed. The purpose of the experiment was to determine whether there is a difference in yield from regular seed and kiln-dried seed (or whether kiln-dried seed produces a higher yield), but results from a test of correlation do not provide us with the information we need to address that issue.

4. $H_0: \mu_d = 0$. $H_1: \mu_d < 0$. Test statistic: $t = -1.532$. Critical value: $t = -1.812$ (assuming a 0.05 significance level). P-value > 0.05 (Tech: 0.0783). Fail to reject $H0$. There is not sufficient evidence to support the claim that kiln-dried seed is better in the sense that it produces a higher mean yield than regular seed. (The sign test can be used to arrive at the same conclusion; the test statistic is $x = 3$ and the critical value is 1. Also, the Wilcoxon signed-ranks test can be used; the test statistic is $T = 13.5$ and the critical value is 8.)

5. For the sample of yields from regular seed, $\bar{x} = 20.0$ and for the sample of yields from kiln-dried seed, $\bar{x} = 21.0$, so there does not appear to be a significant difference. For the sample of yields from regular seed, $s = 3.4$ and for the sample of yields from kiln-dried seed, $s = 4.1$, so there does not appear to be a significant difference.