Math 423 – Prof. Richard B. Goldstein – Walpole – 8th ed – Chapter 8 Answers

8.8 $\bar{x} = 22.2$ days, $\tilde{x} = 14$ days and $m = 8$ days. $\tilde{x}$ is the best measure of the center of the data. The mean should not be used on account of the extreme value 95, and the mode is not desirable because the sample size is too small.

8.22 (a) $\mu_{\bar{X}} = \mu = 174.5$, $\sigma_{\bar{X}} = \sigma/\sqrt{n} = 6.9/5 = 1.38$.

(b) $z_1 = (172.45 - 174.5)/1.38 = -1.49$, $z_2 = (175.85 - 174.5)/1.38 = 0.98$. So,

$$P(172.45 < \bar{X} < 175.85) = P(-1.49 < Z < 0.98) = 0.8365 - 0.0681 = 0.7684.$$

Therefore, the number of sample means between 172.5 and 175.8 inclusive is $(200)(0.7684) = 154$.

(c) $z = (171.95 - 174.5)/1.38 = -1.85$. So,

$$P(\bar{X} < 171.95) = P(Z < -1.85) = 0.0322.$$

8.35 (a) When the population equals the limit, the probability of a sample mean exceeding the limit would be 1/2 due the symmetry of the approximated normal distribution.

(b) $P(\bar{X} \geq 7960 \mid \mu = 7950) = P(Z \geq (7960 - 7950)/(100/\sqrt{25})) = P(Z \geq 0.5) = 0.3085$. No, this is not very strong evidence that the population mean of the process exceeds the government limit.

8.43 (a) $P(S^2 > 9.1) = P\left(\frac{(n-1)S^2}{\sigma^2} > \frac{(24)(9.1)}{6}\right) = P(\chi^2 > 36.4) = 0.05.$

(b) $P(3.462 < S^2 < 10.745) = P\left(\frac{(24)(3.462)}{6} < \frac{(n-1)S^2}{\sigma^2} < \frac{(24)(10.745)}{6}\right)$
$= P(13.848 < \chi^2 < 42.980) = 0.95 - 0.01 = 0.94.$

8.46 (a) 2.145.

(b) $-1.372$.

(c) $-3.499$.

8.53 (a) 2.71.

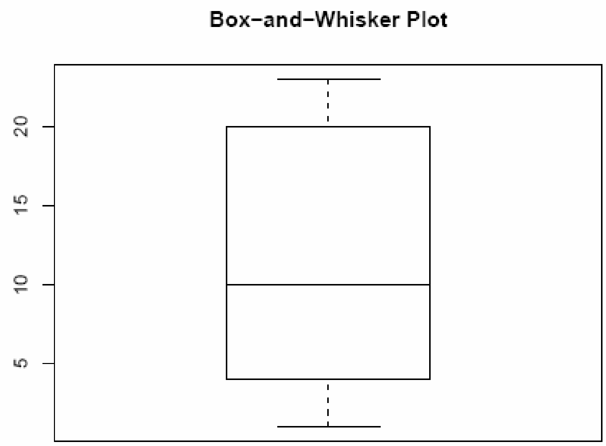
(b) 3.51.

(c) 2.92.

(d) $1/2.11 = 0.47$.

(e) $1/2.90 = 0.34$.

8.56 The box-and-whisker plot is shown below.




The sample mean = 12.32 and the sample standard deviation = 6.08.