Math 107. Homework #7. Solutions.

8.36. The standard deviation of $\bar{x}$ is $\sigma_{\bar{x}} = \frac{3}{\sqrt{30}} \sim 0.5477$.

(a) Since $\frac{1}{0.5477} \sim 1.83$, the probability we are looking for is equal to $0.4664 + 0.4664 = 0.9328$.

(b) We have $\frac{0.5}{0.5477} \sim 0.91$, so the probability is equal to $0.3186 + 0.3186 = 0.6372$.

8.38. The standard deviation of $\bar{x}$ is $\sigma_{\bar{x}} = \frac{1.8}{\sqrt{36}} = 0.3$.

(a) Since $\frac{4.8-4.2}{0.3} = 2.00$, the probability is $0.5000 - 0.4772 = 0.0228$.

(b) Since $\frac{4.1-4.2}{0.3} \sim -0.33$, and $\frac{4.5-4.2}{0.3} = 1.00$, for the probability we are looking for we get $0.1293 + 0.3413 = 0.4706$.

9.4. The maximum error is $E = 1.96\,\frac{3.00}{\sqrt{144}} \sim 0.49$ pounds.

9.6. The maximum error is $E = 1.96\,\frac{0.50}{\sqrt{100}} = 0.098$ minutes.

9.10. The maximum error is $E = 2.575\,\frac{1.84}{\sqrt{120}} \sim 0.4325$ minute.

9.14. Since $n = \left(\frac{2.33 \cdot 2.5}{0.5}\right)^2 \sim 135.72$, the minimum size of the sample is 136.

9.16. Since $n = \left(\frac{1.96 \cdot 8}{2}\right)^2 \sim 61.47$, the minimum size of the sample is 62.