Solution to HW2 due September 23, 2008, Chapter 4, p. 168-169.

3. $\mu = 1.0$ $\sigma = 0.12$ $n = 35$

a) $\mu_{\overline{X}} = 1.0$

b) $\sigma_{\overline{X}} = \dfrac{\sigma}{\sqrt{n}} = \dfrac{0.12}{\sqrt{35}} = 0.02$

c) $P(\overline{X} > 1.0) = 0.5$

d) $P(\overline{X} < 0.95) = P(Z < \dfrac{0.95 - 1.0}{0.02}) = P(Z < -2.5) = 0.0062.$

5. $\sigma = 20$ $n = 50$

$P(\overline{X} < \mu + 4) = P(Z < \dfrac{(\mu + 4) - \mu}{20/\sqrt{50}}) = P(Z < 1.41) = 0.9207.$

8.

a) $n = 20$ $\mu = 182$ $\sigma = 14.7$

$P(180 < \overline{X} \quad 185) = P(\dfrac{180 - 182}{14.7/\sqrt{20}} < Z < \dfrac{185 - 182}{14.7/\sqrt{20}}) = P(-0.61 < Z < 0.91)$

$= 0.8186 - 0.2709 = 0.5477.$

b) $n = 40$ $\mu = 170$ $\sigma = 26.8$

$P(180 < \overline{X} \quad 185) = P(\dfrac{180 - 170}{26.8/\sqrt{40}} < Z < \dfrac{185 - 170}{26.8/\sqrt{40}}) = P(2.36 < Z < 3.54)$

$= 1 - 0.9909 = 0.0091.$

9. $\mu = 3$ $\sigma = 1.5$ $n = 40$

$P(\overline{X} > 3.5) = P(Z > \dfrac{3.5 - 3}{1.5/\sqrt{40}}) = P(Z > 2.11) = 1 - 0.9826 = 0.0174.$