4.53
   a. $P(0 < z < 1.3) = 0.9032 - 0.5000 = 0.4032$
   b. $P(0 < z < 2.7) = 0.9965 - 0.5000 = 0.4965$

4.60 $z_0 = 1.96$

4.63 $z_0 = 1.645$

4.67
   a. $z = 2.326$
   b. $z = -1.96$
   c. $z = 1.96$

4.68 y is Normally distributed with µ=250 and σ=50
   a. $z = 2.326 \Longrightarrow y = 250 + 2.326 * 50 = 366.3$
   b. $z = -1.96 \Longrightarrow y = 250 - 1.96 * 50 = 152$
   c. $z = \pm 1.96 \Longrightarrow (y_1, y_2) = 250 \pm 1.96 * 50 = (152, 348)$

4.71

   a. $P(y < 200) = P\left(z < \frac{200-155}{45}\right) = P(z < 1.00) = 0.8413$
   b. $P(y > 100) = P\left(z > \frac{100-155}{45}\right) = P(z > -1.22) = 0.8892$
   c. $P(100 < y < 200) = P\left(\frac{100-155}{45} < z < \frac{200-155}{45}\right) = P(-1.22 < z < 1.00) = 0.7305$

4.82

   a. $P(y > 7) = P\left(z > \frac{7-5}{1.3}\right) = P(z > 1.54) = 0.0618$

   b. $P(\bar{y} > 5.5) = P\left(z > \frac{5.5-5}{1.3/\sqrt{500}}\right) = P(z > 8.6) \approx 0$ The results of the survey are not

   consistent.

4.86

a. $P(y \le 150) = P\left(z \le \dfrac{150-160}{20}\right) = P(z < -0.5) = 0.3085$

b. $P(\bar{y} \le 150) = P\left(z \le \dfrac{150-160}{20/\sqrt{5}}\right) = P(z < -1.12) = 0.1314$

c. $P(\bar{y} \le 150) = P\left(z \le \dfrac{150-160}{20/\sqrt{n}}\right) = P(z \le -2.326) = 0.01 \Rightarrow \dfrac{150-160}{20/\sqrt{n}} = -2.326 \Rightarrow n = 21.64$

At least 22 measurements would be needed.

4.112 $P(y > 250) = 1 - \displaystyle\sum_{i=251}^{260} \binom{260}{i}(0.95)^i(0.05)^{260-i} = 0.1591$

Or, using the normal approximate, $\mu = (260)(0.95) = 247$, $\sigma = \sqrt{260(0.95)(0.05)} = 3.514$,

$P(y > 250) = 1 - P(y \le 250) \approx 1 - P\left(z \le \dfrac{250-247}{3.514}\right) = 1 - P(z \le 0.854) = 0.1596$

5.6

a. The width of the interval will be increased.
b. The width of the interval will be decreased.

5.10

a. $9.02 \pm (1.645)\dfrac{1.12}{\sqrt{40}} = 9.02 \pm 0.29 = (8.73, 9.31)$

b. Assuming the orange trees used in the sample are representative of all orange trees (the problem gives no reason to think otherwise), the population is all orange trees.