STA 102 Spring 2002
Chapter 8 Solutions to Suggested Even Problems

2, 4, 6 not shown

8.
a) μ = 29.5 mg/100 ml
b) s.d. = σ/sqrt(n) = 29.5/sqrt(20) = 2.07 mg/ 100 ml. This standard deviation is also called the standard error (s.e.) of the mean.
c) The s.d. of the sample means is smaller than the s.d. of the albumin levels themselves, by a factor of 1/sqrt(20).
d) The sample means would be approximately normally distributed.
e) P($\overline{X}$ > 33) = 4.6%
f) P($\overline{X}$ <28) = 23.6%
g) P(29< $\overline{X}$ <31) = 35.9%

10.
μ = 1.81 $\mu g/m^3$; standard error = 0.36 $\mu g/m^3$. Assuming that n = 40 is large enough, the means are approximately normally distributed. The central limit theorem applies even though the underlying population of measurements is skewed to the right.

12.
a) P(13.0 <= $\overline{X}$ <= 13.6) = 0.696 (assuming 15 is large enough for CLT to be in effect)
b) P(13.0 <= $\overline{X}$ <= 13.6) = 0.866
c) Samples of size 121 would be required.
d) Samples of size 482 would be required.

14.
a) μ = 172.2 lb; s.e. = 6.0 lb
b) 179.9 lb is an upper bound for the distribution of sample means.
c) 167.2 lb is a lower bound for the distribution of sample means.
d) P($\overline{X} \geq$ 190) = 0.001. A sample mean this large or larger occurs only 0.1 % of the time (if you were to repeatedly take samples of the same size over an over again). This is a very unusual result.