Self Evaluation Problems
Class 1
Answer Key

Suppose we are interested in estimating the mean dollars charged for coronary artery bypass graft (CABG) surgery at a major medical center. From the literature, the standard deviation of expenditures among patients within a hospital is thought to be approximately $3,000.

1) If the mean expenditure is $35,000, about what fraction of the population of CABG patients will spend between $29,000 and $41,000?

   a) 1%
   b) 5%
   c) 25%
   d) 50%
   e) can't say -- data aren't even approximately normal for the population of CABG patients

   Expenditures for CABG are highly-skewed to higher values.

2) A 95% confidence interval for the mean expenditure in a sample with 100 CABG patients would be how wide?

   95% CI is $\overline{X}_{100} \pm 1.96 \ \ s/\sqrt{100} = \overline{X}_{100} \pm 1.96 \ \ 3{,}000/\sqrt{100} = \overline{X}_{100} \pm \$588$.

3) To obtain a 95% CI that is ±$1,000, how big a sample would be needed?

   $$1.96 s/\sqrt{n} = 1.96(3{,}000/\sqrt{n}) = 1{,}000$$
   $$n = (1.96)^2 3^2 = 35$$