Practice Sample Size Calculation Problems:

1. The RU Chapter of the American Marketing Association (AMA) thinks it would be a good idea to create an online *Marketing Book Exchange*. The exchange would allow RU students to buy Marketing textbooks from and sell Marketing textbooks to other students. The AMA plans to charge a commission fee of $5 for each book sold but, first, needs to determine whether or not current Marketing students would buy/sell their books in this manner. AMA wants to conduct a survey among the current 415 marketing majors at RU. They want to be 99% confident in the results and are only comfortable with a 3% margin of error. How many students does AMA need to sample?

2. You work for the tourist commission in Fort Lauderdale, Florida. You are doing a survey on beer prices during Spring Break at Fort Lauderdale Beach. Last year, the average price per six-pack of beer was $3.75 with a standard deviation of 5.30. Calculate the appropriate sample size where you want to be 90% confident in your results and be within +/- $.25 on the price of six-packs.

3. The entire senior class of 2008 at Radford University (1800 students) decided to take their Spring Break at For Lauderdale Beach. The organization *Mothers Against Drunk Driving* (MADD) decided to conduct a study on daily beer consumption among the RU senior class. In a similar study, researchers found that, on average, college students consume 12 cans of beer per person each day. Based on casual conversations with college students, MADD members found that while some spring break students do not drink any beer, others consumed as many as 21 cans per day. What is the sample size if MADD wants to be 95% confident in its results and within +/- 1.5 cans of beer.

Answers:

1. $$\frac{2.58^2 \,(.5)\,(1-.5)}{.03^2} = \frac{1.6641}{.0009} = 1849$$

    1849 (sample size) / 415 (marketing majors) = 4.45 (since this is > .05, we need to apply the finite correction factor.

    $$\frac{415\,(2.58^2)\,(.5)\,(1-.5)}{415(.03^2) + (2.58^2)\,(.5)\,(1-.5)} = \frac{690.6015}{2.0376} = 338.9289 \text{ (or 339)}$$

2. $$\frac{1.64^2 \,(5.30^2)}{.25^2} = \frac{75.55086}{.0625} = 1208.14 \text{ (or 1209)}$$

3. Standard Deviation = 21 – 0 / 6 = 3.5

    $$\frac{1.96^2 \,(3.5^2)}{1.5^2} = \frac{47.0596}{2.25} = 20.91538 \text{ (or 21)}$$

    21 (sample size calculated) / 1800 (RU seniors) = .01162 -- since this is less than .05, we do NOT need to apply the finite correction factor