QUESTIONS

5.3.1. The production of a nationally marketed detergent results in certain workers receiving prolonged exposures to a *Bacillus subtilis* enzyme. Nineteen workers were tested to determine the effects of those exposures, if any, on various respiratory functions. One such function, air-flow rate, is measured by computing the ratio of a person's forced expiratory volume (FEV_1) to his or her vital capacity (VC). (Vital capacity is the maximum volume of air a person can exhale after taking as deep a breath as possible; FEV_1 is the maximum volume of air a person can exhale in one second.) In persons with no lung dysfunction, the "norm" for FEV_1/VC ratios is 0.80. Based on the following data (169), is it believable that exposure to the *Bacillus subtilis* enzyme has no effect on the FEV_1/VC ratio? Answer the question by constructing a 95% confidence interval. Assume that FEV_1/VC ratios are normally distributed with $\sigma = 0.09$.

Subject	FEV_1/VC	Subject	FEV_1/VC
RH	0.61	WS	0.78
RB	0.70	RV	0.84
MB	0.63	EN	0.83
DM	0.76	WD	0.82
WB	0.67	FR	0.74
RB	0.72	PD	0.85
BF	0.64	EB	0.73
JT	0.82	PC	0.85
PS	0.88	RW	0.87
RB	0.82		

5.3.10. To buy a 30-second commercial break during the telecast of Super Bowl XXIX cost approximately $1,000,000. Not surprisingly, potential sponsors wanted to know how many people might be watching. In a survey of 1015 potential viewers, 281 said they expected to see less than a quarter of the advertisements aired during the game. Define the relevant parameter and estimate it using a 90% confidence interval.

5.3.23. Assume that the binomial parameter p is to be estimated with the function $\frac{X}{n}$, where X is the number of successes in n independent trials. Which demands the larger sample size: requiring that $\frac{X}{n}$ have a 96% probability of being within 0.05 of p, or requiring that $\frac{X}{n}$ have a 92% probability of being within 0.04 of p?