(1) The shopping times of $n = 64$ randomly selected customers at a local supermarket were recorded. The average and variance of the 64 shopping times were 33 minutes and 256 minutes, respectively. Estimate μ, the true average shopping time per customer, with a confidence coefficient of $1 - \alpha = .90$.

(2) When it comes to advertising, "'tweens" are not ready for the hard-line messages that advertisers often use to reach teenagers. The Geppeto Group study found that 78% of 'tweens understand and enjoy ads that are silly in nature. Suppose that the study involved $n = 1030$ 'tweens.

    (a) Construct a 90% confidence interval for the proportion of 'tweens who understand and enjoy ads that are silly in nature.

    (b) Do you think that "more than 75%" of all 'tweens enjoy ads that are silly in nature? Why?

(3) What is the normal body temperature for healthy humans? A random sample of 130 healthy human body temperatures provided by Allen Shoemaker yielded 98.25 degrees and standard deviation 0.73 degrees.

(a) Give a 99% confidence interval for the average body temperature of healthy people.

(b) Does the confidence interval obtained in part (a) contain the value 98.6 degrees, the accepted average temperature cited by physicians and others? What conclusions can you draw?

(4) Historically, biology has been taught through lectures, and assessment of learning was accomplished by testing vocabulary and memorized facts. A teacher-devoloped new curriculum, Biology: A Community Content (BACC), is standards based, activity oriented, and inquiry centered. Students taught using the historical and new methods were tested in the traditional sense on biology concepts that featured biological knowledge and process skills. The results of a test on biology concepts were published in *The American Biology Teacher* and are given in the following table.

	Mean	Sample Size	Standard Deviation
Pretest: all BACC classes	13.38	372	5.59
Pretest: all traditional	14.06	368	5.45
Posttest: all BACC classes	18.50	365	8.03
Posttest: all traditional	16.50	298	6.96

(a) Give a 90% confidence interval for the mean posttest score for all BACC students.

(b) Find a 95% confidence interval for the difference in the mean posttest scores for BACC and traditionally taught students.

(c) Does the confidence interval in part (b) provide evidence that there is a difference in the mean posttest scores for BACC and traditionally taught students? Explain.