(1) Shear strength measurements derived from unconfined compression tests for two types of soils gave the results shown in the following table (measurements in tons per square foot).

Soil Type I	Soil Type II
$n_1 = 30$	$n_2 = 35$
$\bar{y}_1 = 1.65$	$\bar{y}_2 = 1.43$
$s_1 = 0.26$	$s_2 = 0.22$

(a) Do the soils appear to differ with respect to average shear strength, at the 1% significance level?.

(b) Construct a 99% confidence interval for the difference in mean shear strengths for the two soil types.

(c) Is the value $\mu_1 - \mu_2 = 0$ inside or outside this interval?

(d) Based on the interval, should the null hypothesis be rejected? Why?

(e) How does the conclusion that you reached compare with your conclusion in part (a)?

(2) In March 2001, a Gallup poll asked, "How would you rate the overall quality of the environment in this country today—as excellent, good, fair or poor?" Of 1060 adults nationwide, 46% gave a rating of excellent or good.

(a) Is this convincing evidence that a majority of the nation's adults think the quality of the environment is fair or poor? Test using $\alpha = .05$

(b) Construct a 95% lower confidence bound for the proportion of the nation's adults who think the quality of the environment is fair or poor.

(c) How does the value $p = .50$ compare to this lower bound?

(d) Based on the lower bound in part (a), should the alternative hypothesis be accepted?

(e) Is there any conflict between the answer in part (b) and your answer in part (a)?

(3) The output voltage for an electric circuit is specified to be 130. A sample of 40 independent readings on the voltage for this circuit gave a sample mean 128.6 and standard deviation 2.1.

(a) Test the hypothesis that the average output voltage is 130 against the alternative that it is less than 130. Use a test with level .05.

(b) Construct a 95% upper confidence bound for the average voltage reading.

(c) How does the value $\mu = 130$ compare to this upper bound?

(d) Based on the upper bound in part (a), should the alternative hypothesis be accepted?

(e) Is there any conflict between the answer in part (b) and your answer to part (a)?