

1. 10 pts. each In a survey of 2303 U.S. adults, 734 believe in UFOs.
 - (a) Construct a 95% confidence interval for the population proportion of U.S. adults who believe in UFOs.
 - (b) Construct a 98% confidence interval for the population proportion of U.S. adults who believe in UFOs. *The truth is out there!*

2. 10 pts. each You wish to estimate, with 99% confidence, the population proportion of U.S. adults who think that foods containing genetically modified ingredients should be labeled. Your estimate must be within 2% of the population proportion.
 - (a) Find the minimum sample size needed if no preliminary estimate is available.
 - (b) Find the minimum sample size needed if a prior study found that 87% of U.S. adults thinks that foods containing genetically modified ingredients should be labeled.

3. 15 pts. The reserve capacities (in hours) of 18 randomly selected car batteries are as follows:

1.70	1.60	1.94	1.58	1.74	1.60
1.86	1.72	1.38	1.46	1.64	1.49
1.55	1.70	1.75	0.88	1.77	2.07

Assuming the sample is from a normally distributed population, construct a 90% confidence interval for the population variance σ^2 , and also for the population standard deviation.

4. 4 pts. each A company that makes cola drinks states that the mean caffeine content per 12-ounce bottle of cola is at most 40 mg. A random sample of twenty 12-ounce bottles of cola is found to have a mean caffeine content of 41.1 mg. Assume the population is normally distributed and the population standard deviation is 7.5 mg. Let $\alpha = 0.01$.
 - (a) State H_0 and H_a , identifying the claim.
 - (b) Find the critical value(s).
 - (c) Identify the rejection region.
 - (d) Find the standardized test statistic.
 - (e) Can the company's claim be rejected?

5. 4 pts. each A manufacturer claims that the mean battery life of its MP3 players is 30 hours. A random sample of 18 MP3 players is found to have a mean battery life of 28.5 hours and a standard deviation of 1.7 hours. Assume the population is normally distributed, and let $\alpha = 0.01$.
- (a) State H_0 and H_a , identifying the claim.
 - (b) Find the critical value(s).
 - (c) Identify the rejection region.
 - (d) Find the standardized test statistic.
 - (e) Can the manufacturer's claim be rejected?
6. 4 pts. each A research center claims that at least 46% of U.S. adults think that the IRS is not aggressive enough in pursuing people who cheat on their taxes. In a random sample of 300 U.S. adults, 41% say that the IRS is not aggressive enough. Let $\alpha = 0.05$.
- (a) State H_0 and H_a , identifying the claim.
 - (b) Find the critical value(s).
 - (c) Identify the rejection region.
 - (d) Find the standardized test statistic.
 - (e) Can the research center's claim be rejected?