

Name: _____

AP Statistics Chapter 11 Graded Assignment

1. One of the important factors in auto safety is the weight of the vehicle. Insurance companies are interested in knowing the average weight of cars currently licensed in the United States – they believe it is 3000 pounds. To see if that estimate is correct, they checked a random sample of 91 cars. For that group, the mean weight was 2919 pounds, with a standard deviation of 531.5 pounds. Is this strong evidence that the mean weight of all cars is not 3000 pounds?

2. A manufacturer claims that a new design for a cordless phone has increased the range to 150 feet, allowing customers to use the phone throughout their homes and yards. An independent testing laboratory found that a random sample of 44 of these phones worked over an average distance of 142 feet, with a standard deviation of 12 feet. Is there evidence that the manufacturer's claim is false?

3. In 1998, as an advertising campaign, the Nabisco Company announced a "1000 Chips Challenge", claiming that every 18-oz bag of Chips Ahoy cookies contained at least 1000 chocolate chips. Dedicated statistics students at the Air Force Academy purchased randomly selected bags of Chips Ahoy and counted the chips. Their data is given below:

1219	1214	1087	1200	1419	1121	1325	1345
1244	1258	1356	1132	1191	1270	1295	1135

- Check the assumptions and conditions for inference. Comment on any concerns you might have.
- Create a 95% confidence interval for the average number of chips in bags of Chips Ahoy cookies.
- What does this evidence say about Nabisco's claim? Use your confidence interval to test an appropriate hypothesis and state your conclusion.

4. The data below shows the sugar content (as a percentage of weight) of several national brands of children's and adults' cereal. Create and interpret a 95% confidence level for the difference in mean sugar content. Be sure to check the necessary assumptions and conditions.

Children's cereal: 40.3, 55, 45.7, 43.3, 50.3, 45.9, 53.5, 43, 44.2, 44, 47.4, 44, 33.6, 55.1, 48.8, 50.4, 37.8, 60.3, 46.6

Adults' cereal: 20, 30.2, 2.2, 7.5, 4.4, 22.2, 16.6, 14.5, 21.4, 3.3, 6.6, 7.8, 10.6, 16.2, 14.5, 15.8, 4.1, 2.4, 3.5, 8.5, 10, 1, 4.4, 1.3, 8.1, 4.7, 18.4

5. A company with a large fleet of cars hopes to keep gasoline costs down, and sets a goal of attaining a fleet average of at least 26 miles per gallon. To see if the goal is being met, they check the gasoline usage for 50 company trips chosen at random, finding a mean of 25.02 mpg and a standard deviation of 4.83 mpg. Is this strong evidence that they have failed to attain their fuel economy goal?

- a) Write appropriate hypotheses.
- b) Are the necessary assumptions to perform inference satisfied?
- c) Draw a density curve for the mean sampling distribution.
- d) Find the p value and explain its meaning in context.
- e) Draw an appropriate conclusion.