

Practice Test 3 - Brase 4th ed

1. An acne medication manufacturer claimed its product had a mean concentration of 10% benzoyl peroxide. A private lab was hired to test the product. A random sample of 121 bottles of the stuff yielded a sample mean of $\bar{x} = 9.4\%$ benzoyl peroxide. Previous history indicated that the population standard deviation was $\sigma = 2\%$. (a) Set up the two-tailed hypothesis test and test the manufacturer's claim at the 10% level of significance. (b) Show the p-value of the test. (c) Construct the 98% confidence interval for the true population mean.

2. Roller bearings made by a company in Gaffney need to have a mean diameter of one centimeter. A check of 27 randomly selected bearings gave the results listed below. (a) Set up an hypothesis test at the 5% level of significance to see if μ is really one centimeter. Show the results of all your calculations and write your conclusion. (b) Show the p-value of the test. (c) Construct the 95% confidence interval for the true population mean diameter.

1.1	0.9	1.2	1.0	0.8	1.2	1.2	1.0	0.9
0.9	1.3	1.0	1.0	1.0	0.7	1.4	0.9	1.8
1.1	0.9	1.4	1.4	0.9	1.0	1.0	1.0	0.9

$\bar{x} = \underline{\hspace{2cm}}, \quad s = \underline{\hspace{2cm}}$

3. A political correspondent claims that the incumbent, Representative Robate, has 45% of the voting public on his side. But Rep. Robate's party office says the population proportion is higher. A random sample of 81 voters had 40 in favor of Rep. Robate. Is this sufficient evidence for the party office to reject the correspondent's claim and conclude that the proportion is significantly higher? Use a 5% level of significance. (a) Show your hypothesis test. (b) Show the p-value of the test. (c) Construct a 95% confidence interval for the true population proportion.
4. A tire manufacturer claims its tires last at least 45,000 miles, on average. A random sample of 36 tires had an average life of 43,500 miles and a standard deviation of 2800 miles. Is there sufficient evidence to reject the manufacturer's claim? (a) Test the hypothesis at the 1% level of significance. (b) Show the p-value of the test. (c) Construct the 95% confidence interval for the true mean tire life.