照片: L11.Formative

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9-46. A bearing used in an automotive application is supposed to have a nominal inside diameter of 1.5 inches. A random sample of 25 bearings is selected and the average inside diameter of these bearings is 1.4975 inches. Bearing diameter is known to be normally distributed with standard deviation $\sigma = 0.01$ inch.

(a) Test the hypothesis H_0: $\mu = 1.5$ versus H_1: $\mu \neq 1.5$ using $\alpha = 0.01$. 1

(b) What is the P-value for the test in part (a)? 2

(c) Compute the power of the test if the true mean diameter is 1.495 inches. 3

(d) What sample size would be required to detect a true mean diameter as low as 1.495 inches if we wanted the power of the test to be at least 0.9? 4

(e) Explain how the question in part (a) could be answered by constructing a two-sided confidence interval on the mean diameter. 5 6