

Example 1

A pharmaceutical manufacturer does a chemical analysis to check the potency of products. The standard release potency for cephalothin crystals is 910. An assay of 16 lots gives the following potency data:

897	914	913	906	916	918	905	921
918	906	895	893	908	906	907	901

Assume the population standard deviation is 8 units. Test the hypothesis that the population mean potency is different from the standard release potency.

- (1) Define the population quantity of interest in this study. This is called the *population parameter*.
- (2) Carefully state the hypotheses to be tested about the population.
- (3) What is the sample size?
- (4) What quantity will be used as an estimate of the parameter from (1)?
- (5) What is the distribution of the sample estimate? Why?
- (6) What is the standard deviation of the sample estimate?
- (7) What is the value of the sample estimate for the sample in this study?
- (8) Find the test statistic. What does this measure?
- (9) Give the p-value for the test in (2). What does this measure?
- (10) Carefully state your conclusions.
- (11) What *assumptions* have we made for this procedure to be valid?