

# Small-Sample Test of a Hypothesis about a Population Mean

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## The Copiers Example



# The Problem:

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Suppose copiers average 100,000 between paper jams. A salesman claims his are better, and offers to leave 5 units for testing. The average number of copies between jams is 100,987, with a standard deviation of 157. Does his claim seem believable?



## 8.4: Small-Sample Test of a Hypothesis about a Population Mean

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$$H_0: \mu = 100,000$$

$$H_a: \mu < 100,000$$

*Test Statistic:*

$$t = \frac{\bar{x} - \mu_0}{s / \sqrt{n}}$$

$$t = \frac{100,987 - 100,000}{157 / \sqrt{5}}$$

$$t = 14.06$$

$$p\text{-value: } P(|t_{df=4}| > 14.06) < .002$$

Reject the null hypothesis based on the very low probability of seeing the observed results if the null were true. So, the claim does seem plausible