

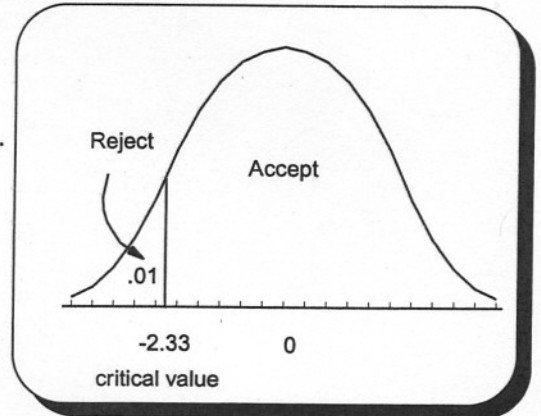
Inferential Statistics Test Solutions

- I. A sample of 36 out of 25,000 baseball fans attending a game revealed average refreshment spending of \$7.60. The population standard deviation was \$2.10. The makers of Dud beer will not distribute their product to a ballpark unless it is possible that the average fan spends at least \$8.00 on refreshments. Use the 5-step approach to hypothesis testing and a .01 level of significance to test whether this ballpark qualifies to receive Dud beer.

1. $H_0: \mu \geq \$8.00$ and $H_1: \mu < \$8.00$
2. Type I error of .01 $\rightarrow Z = \pm 2.33$
3. \bar{x} is the test statistic.
4. If z from the test statistic is beyond the critical value of z , reject H_0 .
5. Apply the decision rule.

$$Z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{\$7.60 - \$8.00}{\frac{\$2.10}{\sqrt{36}}} = \frac{-.40}{.35} = -1.14$$

H_0 is accepted because -1.14 is not beyond -2.33.
The mean could be $\geq \$8.00$. Have a Dud beer.



- II. A marketing test of chocolate flavored shaving cream revealed a favorable response from 35 of 50 test subjects. Test subjects were chosen at random from the company's 1,200 employees. This product will be manufactured if at least 80% of the potential market like the product.

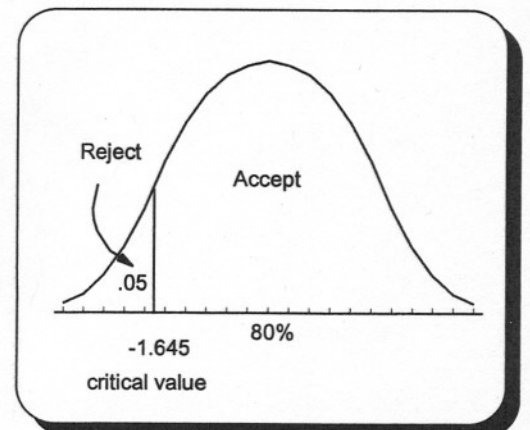
- A. Using the 5-step approach to hypothesis testing and a .05 level of significance, determine whether the product will be manufactured.

1. $H_0: p \geq 80\%$ and $H_1: p < 80\%$
2. Type I error is .05.
3. \bar{p} is the test statistic.
4. If z from the test statistic is beyond the critical value of z , reject H_0 .
5. Apply the decision rule.

$$\begin{aligned} n &= 50 \geq 30 \\ np &= 50(.80) = 40 \geq 5 \\ nq &= 50(.20) = 10 \geq 5 \end{aligned}$$

$$\begin{aligned} Z &= \frac{\bar{p} - p}{\sqrt{\frac{p(1-p)}{n}}} \\ &= \frac{.7 - .8}{\sqrt{\frac{.8(1-.8)}{50}}} \\ &= -1.77 \end{aligned}$$

Reject H_0 because -1.77 is beyond -1.645.
The mean could not be 80% at the .05 level of significance. Too bad, chocolate flavored shaving cream will not be produced.



- B. What are the pros and cons of using company employees to test this product?

Using company employees is convenient. Company employees have a vested interest in giving the survey adequate attention. On the other hand, some employees might be prejudice for or against the company.