HYPOTHESIS TEST

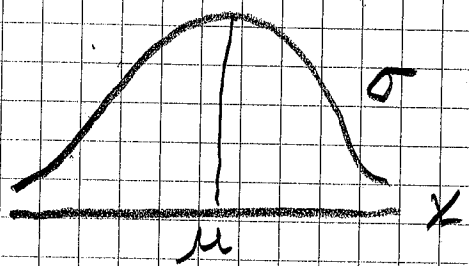
Suppose you want to determine whether the mean content of Superola cans is less than 12 oz

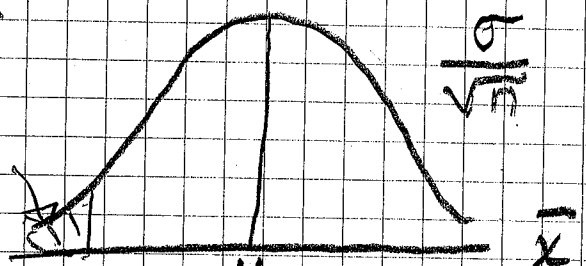
Hypothesis Test	Trial by Jury
Superola cans	Accused
Researchers	Prosecution
Data	Evidence
Claim: $\mu < 12$	Charges against the accused
we assume that the claim is not true until we have sufficient evidence to the contrary	Charges are assumed to be not true until proven otherwise beyond reasonable doubt

$n = 50$
$\bar{x} = 11.7$
$s = 1$

Assume $H_0: \mu \not< 12$ $\quad \mu = 12$
Claim $H_a: \mu < 12$

$n = 50 \quad \bar{x} = 11.7 \quad s = 1$





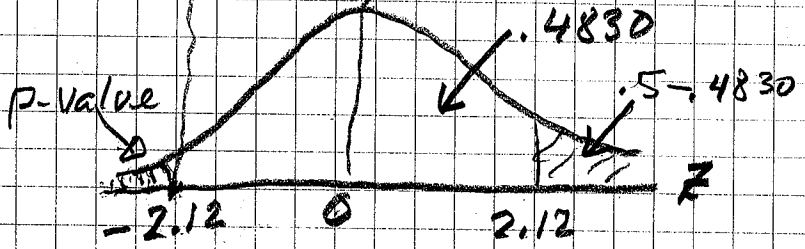
$H_0: \mu = 12$

$H_a: \mu < 12$

$$z = \frac{x - \mu}{\sigma}$$

$$\boxed{z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}}$$

Test statistic



$$z = \frac{11.7 - 12}{1/\sqrt{50}} = -2.12$$

p-value = .5 - .4830 = .017

and that is the probability of getting a sample mean of 11.7 or farther to the left, assuming that $\mu_0 = 12$

that is a very small probability!

(A very unlikely event)

Reject H_0 and conclude H_a

$\alpha = .05$ the level of significance

$\alpha = .01, .10$

Decision Rule:

"If p-value $< \alpha$, reject H_0 and conclude H_a"

Conclusion:

"The data provide sufficient evidence to conclude that all Superoola cans have a mean content less than 12 oz"

Summary

Step 1 Set up H_0:
H_a:

Step 2 Test statistic

Step 3 P-value Rejection Regions

Step 4 Decision

Step 5 Conclusion
, at $\alpha = .05$