29 May 2022 16:00

1. Confidence Interval - Mean, Proportion
2. Some other std. distributions
3. Hypothesis Testing - F ANOVA

→ If X is a normal distribution with mean = 10, var = 25
Then X^4 is ??

$X \sim \text{Norm}(5, 16)$ (μ, σ^2)

$X - 5 \sim \text{Norm}(0, 16)$

$Z = \frac{X-5}{4} \sim \text{Norm}(0, 1)$

$\text{Var}\left(\frac{X-5}{4}\right) = \frac{1}{16} \text{Var}(X-5)$

$X \sim \text{Norm}(\mu, \sigma^2)$

$\frac{X-\mu}{\sigma} \sim \text{Norm}(0, 1)$

$\frac{X_1 + X_2}{2} \sim \text{Normal}\left(\mu, \frac{\sigma^2}{2}\right)$

Assumption:
Population distribution is normal

$X_1 \sim \text{Norm}(\mu, \sigma^2)$
$X_2 \sim \text{Norm}(\mu, \sigma^2)$

H_0: $w \leq 5$ ($w = 5$)

H_a: $w > 5$

(1. Assume null hypothesis to be true.)

$\bar{X} = \frac{X_1 + \dots + X_{50}}{50} \sim \text{Normal}(5, \sigma^2)$

$$\bar{X} = \frac{X_1 + X_2 + X_3 + \cdots + X_{50}}{50} \sim \text{Normal}\left(5, \frac{\sigma^2}{n}\right)$$

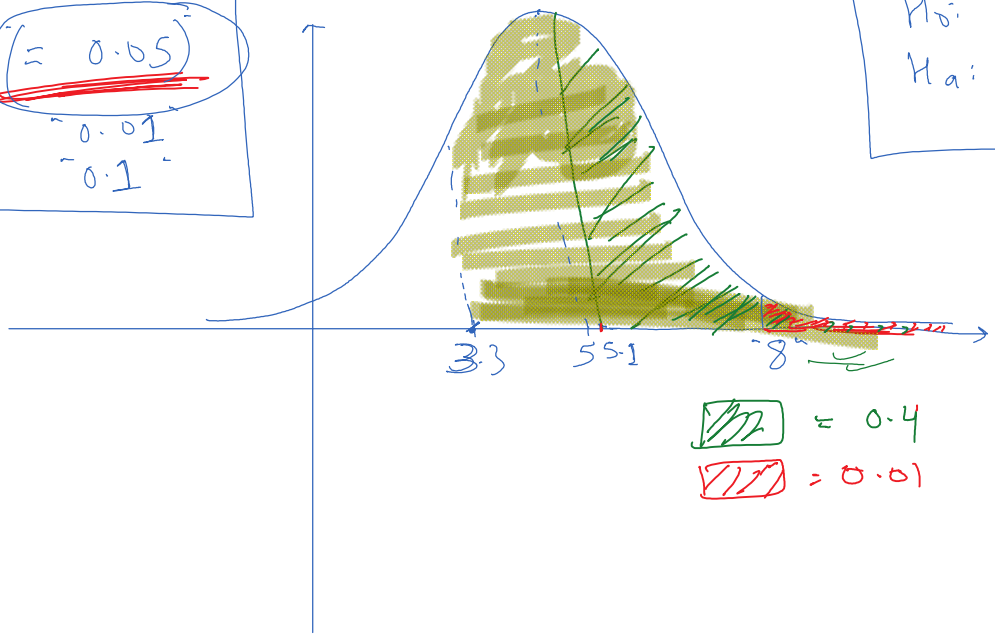
Type-1 error: $(= 0.05)$

0.01

0.1

$H_0: \mu = 5$

$H_a: \mu > 5$



= 0.4

= 0.01