

For $X \sim \text{Bernoulli}(p)$ based on a sample of size $n = 20$ one designed a test

$H_0 : p = 0.5$ versus $H_a : p \neq 0.5$
Test Statistic $T = X_1 + \cdots + X_{20}$
Reject H_0 if $T \leq 5$ or $T \geq 15$

1. Express $\beta(p)$ through Binomial distribution $B(n, p)$.
2. Find the significance level of the test.
Use link on www.math.wichita.edu/~xhu to Binomial distribution calculator.
3. Find the power of the test at $p = 0.8$.
4. Find the probability of Type II error at $p = 0.3$.