

Suppose you have a random sample of size 5,112 from $N(\mu, \sigma^2)$. Derive the rejection region for a test of size 5% of the null hypothesis that the mean is zero against the alternative that the mean is larger than zero. What is the power of the test if the mean is 0.001? Hint: a t-distribution with thousands of degrees of freedom can be VERY well approximated as a standard normal. Your answer should be expressed in terms of the cdf of a standard normal and the unknown variance of the population.