

IEOR 3600: HMWK 9

1. Chapter 9:

Page 314; 42.

Page 320; 44,47,48.

Page 324; 63,64,65,69,71

Page 330; 85.

2. A winery claims that the alcohol content of its red wine is (on average) $\mu = 0.13$ (e.g., 13%.) 400 randomly selected bottles are sampled and the sample average is 0.142 with a sample variance of $s^2(n) = 0.01$. You already did (HMWK 8) the hypothesis test (using the normal Z , since $n = 400$ is large) of $H_0 : \mu = 0.13$ versus $H_1 : \mu \neq 0.13$ at the 95%, and you rejected H_0 . Suppose that it is very important that the alcohol content not be as high as 14% (since this might destroy the wine's ability to age). Assume that $\sigma^2 = 0.01$ is exact (so $\sigma = 0.1$). If $\mu = \mu_1 = 0.14$ is actually the correct value, then compute $\beta =$ probability of a Type II error, the error that you would not reject H_0 even though it is false. What sample size n would be needed to reduce this β down to 0.10? (e.g., so that the *power* of the test, $1 - \beta =$ the probability of correctly rejecting H_0 if $\mu = 0.14$ goes up to about 0.90.)