Assignment #8 Due March 26

Ch 8: Exercises 10,26,27,40,52

#10 - Here is some quite detailed help for this exercise.

Population Strength Distribution is $N(\mu,\sigma=60)$ - units are KN/m^2

a) H_0: $\mu = 1300$
H_a: $\mu > 1300$

b) $\overline{X}$ is $N(1300,60/\sqrt{20}) = N(1300,13.416)$ when H_0 is true.
Rejection region is specified as $\overline{X} \geq 1331.26$
P(type I error)= $P(\overline{X} \geq 1331.26)$ assuming H_0 true ....

c) With the assumption $\mu = 1350$, $P(\overline{X} \leq 1331.26) =$ ....

d) We need to change the rejection region $\overline{X} \geq c$ so that $P(\overline{X} \geq c) = .05$
where $z= (c-1300)/13.416= 1.645$
(since N(0,1) table has $P(z \geq 1.645)=.05$). ....
Increasing the type I error rate will reduce the type II error rate when $\mu = 1350$. The new type I and type II error rates are ....

e) (see calculation in part b)).

26. The rejection region (of the $H_0 = \mu = 50$) in this case, for type I error = .05, must be $z>1.645$. We need to compute z based on our sample mean data and compare with 1.645.

27 Here we need t (one tail) for 41 degrees of freedom corresponding to a type I error rate of .01, and from table A.5, this is -2.423 so $P(t \leq -2.423)=.01$. So the test statistic t needs to be computed for comparison with -2.423.

40. a) 40/500 is 8% which is greater than the premise of 5%. So the question is whether a sample proportion of .08 or more would occur if the true population proportion were .05. We need to see how large a proportion would be exceeded with probability 0.01.

b) This is a type II error probability.

#52 No advice ... (unless you talk to me ...)