Practice Thought Questions/Problems for Week 6

1) Thought question -- *why* don't allele frequencies change with Hardy-Weinberg, even when some alleles are dominant?

2) Imagine a locus with 2 alleles, A and a, that is always at Hardy-Weinberg. Say "p" reflects the frequency of A. At p=0.01, there are far more homozygous aa than there are heterozygotes (Aa). At p=0.5, there are more heterozygotes (Aa) than homozygous aa. At what frequency of p between p=0.01 and p=0.5 are there an equal number of Aa and aa at Hardy-Weinberg?

3) Is the population below at Hardy-Weinberg? What are the Hardy-Weinberg expected genotype frequencies and the observed genotype frequencies?
BB: 750
Bb: 100
bb: 150

4) In the example above, is the deviation in the direction that may be expected from a Wahlund effect? Or opposite?

5) Calculate F_{ST} in the example above assuming it really was from an equal pooling of two populations.

6) Given the F_{ST} above, do we predict there was much recent gene flow?

7) If we assume the data in problem 3 was actually a result of inbreeding rather than sampling across populations, what would F be?

8) If the F in problem 7 was correct and general, is that level of inbreeding sufficient to cause physiological problems? Note, this is not a "yes" or "no" question, but one that requires some discussion/consideration.