Practice Thought Question/Problem Answers for Week 3

1) Rows 2, 3, and 5

2) Yes, because you can still have recombination in the form of independent assortment. Basically, genes ***on different chromosomes*** can still be recombinant.

3) By genetic mapping.

4) True

5) None

6) A-B: 15+1+1+15 = 32 32/1000 = 0.032 or 3.2 cM
B-C: 34+15+37+15 = 101 101/1000 = 0.101 or 10.1 cM
A-C: 34+1+1+37= 73 73/1000 = 0.073 or 7.3 cM
Gene A is in the middle (since B-C is longest distance)

7) When calculating the recombination fraction between B-C, we counted the two 1's as parental when, in fact, they're double recombinant. If we wanted a more precise estimate of distance, we'd actually count those as TWO recombination events each. By adding 4 to the total number of recombinants, the totals would be equal.

AC 73 recombinants + AB 32 recombinants = 105 recombinants
BC 101 observed recombinants + 2 (1+1) = 101+4 = 105

For more practice with recombination distance calculations among 3 genes, you can generate your own problems using the Perl script uploaded into the website. This is the same program that will be used to generate problems in your course assessments.

8) Possible, but highly unlikely. You've merely seen an association between a marker and a phenotype which is the essence of mapping, but you don't know that particular SNP causes it. It may be the SNP is just very close and linked to a mutation that causes the disease.

9) Neither. If you look, every genotype has 20% of the people exhibiting hypertension. Thus, no genotype is disproportionately associated with the disease.