Name:_____ Dr. Reichler's Bio 325 Fall 2007 pre-exam 3 quiz

1) When looking at the inheritance of two traits coded for by two different genes, what can you infer from a cross that results in 50% recombinant offspring?
The genes are either far apart on the same chromosome (unlinked) or on two different chromosomes.

2) Two people mate. They are heterozygous for three different traits coded for by three different genes (A, B, and I). The A and B genes have simple dominance, and the I gene has incomplete dominance. What is the chance of having an offspring that has the recessive phenotype for A and B with the intermediate trait for I?
0.25x0.25x0.5= 3.125%

3) Two individuals have mutations in two of their smell receptors on chromosome 11. One for the ability to smell apples, and the other to smell oranges. The mutations act as recessive alleles. You want to know how far apart the genes are. Two heterozygous individuals mate and have 100 offspring with the following traits. 80 can smell both oranges and apples, 12 cannot smell apples or oranges, while 4 can smell apples but not oranges, and 4 can smell oranges but not apples. How far apart are these two genes?
8 m.u.

4) What might lead to discrepancies between a genetic map and the actual DNA sequence?
Areas of the DNA that have greater or less than average crossing-over.

5) Is it likely that human height is coded for by one or more genes? What else might contribute to human height?
Yes, there is great variation in human height that indicates many genes impacting this trait. Environmental factors also play a role.

6) Would an individual's age be a good measure of their evolutionary success?
No, reproduction is the key to evolutionary success.

7) What does information about human DNA tell us about how long ago we shared a common ancestor?
The information is conflicting. The mtDNA and Y-chromosome indicate a common ancestor about 150,000 years ago, but other nuclear DNA indicates a common ancestor of about 1-2 million years ago.

8) When looking at human mtDNA, what different information can be gained from looking at population's DNA versus individual's DNA?
Comparisons of populations DNA show how different groups may be related, but looking at individuals shows that even in any group there is variation in DNA, and some members of a geographic group may not be very closely related by DNA.