Bio 97: Genetics
Epistasis and Complementation, Exceptions to Mendel, Chi Square, and the Chromosomal Basis of Human Disease - Answer Key

1.) Multiple gene loci controlling a single trait.

2.) Epistatic. Hypostatic.

3.) 9:3:3:1

4.) Two homozygous recessive mutants have mutations in different genes, resulting in normal offspring. Failure to complement is when these two homozygous recessive mutants have mutations in the same gene, resulting in the same or mutant alleles.

5.) They are allelic when there is a failure to complement. They are not when there is complementation.

6.) Incomplete dominance. Suppose a red rose and white rose produce a pink rose.

7.) Co-dominance. Think blood type.

8.) The trait is expressed to variable degrees, but the allele is the same. Think polydactyly.

9.) Incomplete penetrance. You're family is predisposed to lung cancer, but you don't smoke. You may not display the cancer phenotype.

10.) 0.2583

11.) The complete set of chromosomes in an organism. Also describes the number of appearance of chromosomes.

12.) Metacentric: two arms of chromosome are roughly equal in length. Submetacentric: arms lengths are unequal. Acrocentric: one is so short that it is hard to observe, but it is still present.

13.) Exact multiples of the haploid genome; diploids/triploids/tetraploid.

14.) Individual chromosomes or chromosome regions are missing or in excess; trisomy/monosomy. Causes may include: non-disjunction, translocation, etc.

15.) Translocation.
16.) Balanced translocations are still euploid, but may become unbalanced after meiosis. Unbalanced translocations give aneuploids.

17.) Robertsonian translocation.

18.) Gene duplication.