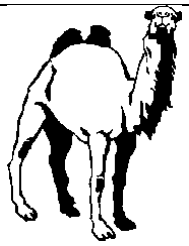
Genetics Homework Assignment (due Friday, 10/24)
BI-102, Fall '08, Dr. C. S. Tritt

1. A man with AB blood has three children with a woman with type A blood. The children's blood types are A, AB and B. Can the genotypes of the parents be determined using only the given information and, if so, what are they? Explain the reasoning you used to obtain your answer.

The following problem deals with *Camelus mozeus* a rare animal native to Wisconsin's north woods and Michigan's Upper Peninsula. MSOE tried to development a miniature variety of these animals for sale as house pets, but they never become popular or commercially successful. In the process, biologists at MSOE developed a rather complete understanding of their (the camels', not the biologists') genetics. Currently identified phenotypes are:

 Wild Type	 Black	 Dark Legs
 Dark Rear	 Dark Humps	 Dark Neck
 Zebra strips	 Big Ears	 Big Tail

2. When true breading Dark Neck animals are breed with wild type animals, the F_1 generation is all phenotypically wild type. When these F_1 animals are self crossed, the resulting F_2 generation consists of wild type and dark necked animals in a 3:1 ratio, respectively. Explain this result in terms of what type of trait Dark Neck is (dominate or recessive). Use Punnett squares to illustrate and support your explanation.

3. Assume that Black is an autosomal dominate trait and that it is epistatic with respect to Dark Rear, in that dark rear coloring would be obscured by the overall black color. Assume that Dark Rear is also an autosomal dominate trait and that it assorts independently of Black. Predict the phenotype ratios for the F_1 and F_2 generations of a cross between true breeding Black animals (known to be homozygous wild type at the Dark Rear loci) and true breeding Dark Rear animals. Use Punnett squares to support your answers.

4. Assume Zebra Strips is an X linked dominate trait. Use Punnett squares to predict the expected phenotypic ratios in the F_1 and F_2 generations resulting from *a*) crossing a Zebra Stripped male with a wild type female and *b*) crossing homozygous Zebra Stripped female with a wild type male. Be sure to differentiate between male and female offspring.