**Genetics Worksheet #3: Dihybrids**

1. Use the given information to answer the following questions:

T = tall R = round

t = short r = wrinkled

* 1. phenotype of Ttrr
  2. genotype(s) of tall round
  3. gametes of ttRr
  4. gametes of ttrr and its phenotype

1. In guinea pigs, the gene for black fur, B, is dominant to the gene for white fur, b. The gene for rough coat, R, is dominant to the gene for smooth coat, r.
   1. A pig, heterozygous for both traits, is crossed with a white smooth pig. What is the expected genotypic and phenotypic ratios of the offspring?
   2. If an individual heterozygous for black fur with a smooth coat from the F1 is crossed with an F1 who is white and heterozygous for rough coat are crossed, what is the genotypic and phenotypic ratios of the offspring?
2. In man, the ability to taste PTC (a bitter taste test) is inherited as a dominant trait; inability to taste this chemical is determined by a recessive allele. The gene for ability to roll the tongue is dominant to the allele for inability to roll the tongue. Suppose a non-rolling woman heterozygous for tasting, marries a non-tasting man, heterozygous for rolling. Describe all the genotypic and phenotypic possibilities in their children.
3. If a certain cross shows the following ratios, what are the probable genotypes of the parents?
   1. 12 black : 5 white
   2. 96 tall green : 88 short yellow : 93 tall yellow : 99 short green
   3. 19 black rough : 6 black smooth : 7 white rough : 2 white smooth
4. Black coat (B) in cocker spaniels is dominant to white coat (b). Solid coat (S) pattern is dominant to spotted coat (s). A male that is black with a solid pattern mates with three females. Female A, which is white, solid, produces 4 pups, 2 black solid, and 2 white solid. Female B, which is black solid, produces one pup, white, spotted. The mating with female C, which is white, spotted, produces four pups: one black solid, one black spotted; one white spotted; one white solid. Indicate the crosses, showing all the genotypes for each cross.
5. A horse that is homozygous for the allele Cr will have a chestnut, or reddish coat. A horse that is homozygous for the allele Cm will have a very pale cream coat, called cremello. Palomino coat colour is determined by the interaction of both the chestnut and cremello allele. Indicate the expected genotypic ratio and phenotypic ratio of the F1 progeny of a palomino horse with a cremello horse.
6. For Mexican hairless dogs, the hairless trait is dominant to hairy. A litter of eight pups is found; six are hairless and 2 are hairy. What are the genotypes of their parents?