**Hardy-Weinberg Practice Problem Set #2**

1. You have sample a population in which you know that the percentage of homozygous dominant (AA) is 25%. Using that 25%, calculate the following:
2. The frequency of the “AA” genotype. 25%
3. The frequency of the “A” allele. 50%
4. The frequency of the “a” allele. 50%
5. The frequencies of the genotypes “Aa” and “aa”.

Aa = 50%

Aa = 25%

1. If 72 out of 200 individuals in a population express the recessive phenotype, what percent of the population are homozygous dominant? What percent of the population are heterozygotes?

Homozygous Dominant = 16%

Heterozygous = 48%

1. Right handedness (H) is dominant to left handedness (h). In a small town of 600 people, 504 are right handed. Determine the following:
2. What is the predicted frequency of heterozygotes? 48%
3. What is the predicted frequency of homozygous dominant? 36%
4. What is the predicted frequency of homozygous recessive? 16%
5. Cystic Fibrosis is caused by a recessive allele. Of 10,000 Caucasian births, 5 were found to have Cystic Fibrosis and 442 were found to be heterozygous carriers of the mutation that causes the disease. Calculate the “p” and “q” values.

Q = 0.022

P = 0.988

1. A population of squirrels contains 13 animals with grey tails and 25 animals with brown tails. Brown tails are a dominant trait.
2. What if the frequency of the grey allele? 0.585
3. What is the frequency of the brown allele? 0.415
4. What is the frequency of squirrels homozygous for the brown allele? 0.172

***Challenge Problem***

Note: These types of problems will not be on the quiz. However, they represent good practice and they are a fun challenge.

*Hardy-Weinberg Equation for Three Alleles*

p2+q2+r2+2pq+2pr+2qr=1

p+q+r=1

1. In a population of snails, the gene for shell color has three alleles T, t, and d, where T is the dominant allele, while t and d are co-recessive. Snails with the genotypes TT, Tt, or Td have a dark brown shell. Homozygous recessive tt snails have a red shell, homozygous recessive dd snails have a yellow shell, and heterozygous recessive td snails have a light brown shell.

In a sample of 225 snails you count 25 red snails and 16 yellow snails. What are the frequencies of the three alleles T, t, and d?

Q = 0.333

R = 0.267

P = 0.400