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**Hardy Weinberg Practice Worksheet**

AP Biology, 2018-2019

***Calculations:*** *Determine the correct value for each scenario given below. Show all your work, and use the following equations to help you.*

|  |  |
| --- | --- |
| Allele Frequencies | p + q = 1 |
| Genotype Frequencies | p2 + 2pq + q2 = 1 |

1. 1 A certain homozygous recessive genotype occurs in 4% of a population. What is the frequency of its two alleles, T and t?
2. If q = 0.3 and there are Hardy-Weinberg proportions, what is the most common genotype and what is its frequency? What is the least frequent genotype and its frequency?
3. In *Drosophilia*, the allele for normal length wings is dominant over the allele for vestigial wings. In a population of 1,000 individuals, 360 show the recessive phenotype. How many individuals would you expect to be homozygous dominant?
4. In a population of 2,000 earthworms, there is a condition governed by a recessive allele where the worms do not have any setae. Setae are tiny hair-like projections needed by the worm to move through the ground. 500 worms were found not having setae. What percent of the population were heterozygous for the setae?
5. The allele for a hitchhiker's thumb is dominant over a straight thumb. In a population of 1000 individuals, 510 show the dominant phenotype. What is the frequency of the dominant allele?

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|  |  |
| --- | --- |
| Allele Frequencies | p + q = 1 |
| Genotype Frequencies | p2 + 2pq + q2 = 1 |

1. A very large population of randomly-mating laboratory mice contains 25% white mice. White coloring is caused by the double recessive genotype, "aa". Calculate the frequency of the dominant allele.
2. The allele for a widow's peak (hairline) is dominant over the allele for a straight hairline. In a population of 500 individuals, 9% show the recessive phenotype. How many individuals would you expect to be heterozygous for the trait?
3. Let’s say that brown fur coloring is dominant to gray fur coloring in mice. If you have 168 brown mice in a population of 200 mice then what is the frequency of the homozygous recessive genotype.
4. A rather large population of Doodle bugs 396 red-sided individuals and 557 tan-sided individuals. Assume that red is totally recessive. How many individuals have a homozygous dominant genotype?
5. A Pangorian trait which results from simple Mendelian inheritance is antenna shape. Corkscrew antennae (A) are dominant over straight antennae (a). When the entire Pangorian population was screened (all 9,904 of them),3,565 had corkscrew, while the rest had straight antennae. What is the frequency of the dominant allele?