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| **p2 + 2pq + q2 = 1** | **p + q = 1** |
| p = frequency of the dominant allele in the population q = frequency of the recessive allele in the population p2 = percentage of homozygous dominant individuals q2 = percentage of homozygous recessive individuals 2pq = percentage of heterozygous individuals | |

1. You have sampled a population in which you know that the percentage of the homozygous recessive genotype (aa) is 36%. Calculate the following:
2. The frequency of the "aa" genotype.
3. The frequency of the "a" allele.
4. The frequency of the "A" allele.
5. The frequencies of the genotypes "AA" and "Aa."
6. The frequencies of the two possible phenotypes if "A" is completely dominant over "a."
7. Within a population of butterflies, the color brown (B) is dominant over the color white (b). And, 40% of all butterflies are white. Given this information, calculate the following:
8. The percentage of butterflies in the population that are heterozygous.
9. The frequency of homozygous dominant individuals.
10. Cystic fibrosis is a recessive condition that affects about 1 in 2,500 babies in the Caucasian population of the United States. Please calculate the following.
11. The frequency of the recessive allele in the population.
12. The frequency of the dominant allele in the population.
13. The percentage of heterozygous individuals (carriers) in the population.
14. The allele for a widow's peak (hairline) is dominant over the allele for a straight hairline. In a population of 500 indiviuals, 25% show the recessive phenotype. How many individuals would you expect to be homozyous dominant and heterozygous for the trait?
15. The allele for a hitchhiker's thumb is recessive compared to straight thumbs, which are dominant. . In a population of 1000 individuals, 510 show the dominant phenotype. How many individuals would you expect for each of the three possible genotypes for this trait.