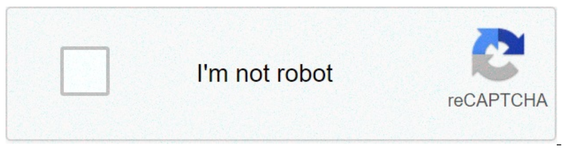

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Hardy weinberg equilibrium practice problems

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PROBLEM #1. You sampled a population where you know the percentage of recessive homozygous genotype (aa) is 36%. Using that 36%, calculate the following: The frequency of the genotype Â”aa.Â” The frequency of the allele Â”a.Â” The frequency of the allele Â”A.Â” The frequencies of the genotypes Â”AA” and Â”Aa.Â” The frequencies of the two possible phenotypes if Â”A It is completely dominant on “a”. PROBLEM #2. Sickle cell anemia is an interesting genetic disease. Normal homozygous (SS) individuals have normal blood cells that are easily infected by the malaria parasite. Thus, many of these individuals become seriously ill due to the parasite and many die. Individuals homozygous for the sickle cell tract (ss) have red blood cells that collapse readily when deoxygenated. Although malaria cannot grow in these red blood cells, individuals often die because of the genetic defect. However, individuals with the heterozygous (Ss) condition have a few sickles of red blood cells, but generally not enough to cause mortality. In addition, malaria does not survive well within these “partially defective” red blood cells. Therefore, heterozygogtes tend to survive better than either of them. homozygous conditions. If 9% of an African population is born with a severe form of sickle cell anemia (ss), what percentage of the population will be more resistant to malaria because it is heterozygous (Ss) for the sickle cell gene? PROBLEM #3. There are 100 students in a class. Ninety-six did well in the course, while four failed completely and received an F mark. I’m sorry. In the very unlikely event that these traits are genetic rather than environmental, if these traits involve dominant and recessive alleles, and if the four (4%) represent the frequency of the homozygous recessive condition, calculate the following: The frequency of the recessive allele. The frequency of the dominant allele. Frequency of heterozygous individuals. PROBLEM #4. Within a butterfly population, brown (B) is dominant over white (b). And 40% of all butterflies are white. Given this simple information, which is something you will most likely find at an examination, calculate the following: The percentage of butterflies in the population that are heterozygous. Frequency of dominant homozygous individuals. PROBLEM #5. A fairly large population of biology teachers has 396 individuals with red sides and 557 individuals with tanned sides. Suppose red is completely recessive. Calculate the following: The allele frequencies of each allele. Genotype frequencies expected. The number of heterozygous individuals expected to be in this population. The expected phenotype frequencies. This year the conditions are great for breeding, and next year there are 1,245 “potential” young biology instructors. Assuming all the Hardy-Weinberg conditions satisfied, how many of these conditions would you expect to be red and how many tan? PROBLEM #6. Very Very Very Very the population of randomly coupled laboratory mice contains 35% white mice. The white color is caused by the double recessive genotype, "aa." Calculates the allelic and genotypic frequencies for this population. PROBLEMA #7. After graduation, you and 19 of your closest friends (say 10 males and 10 females) rent a plane to make a round of the world. Unfortunately, all of you landed on a deserted island. No one finds you and you start a new population completely isolated from the rest of the world. Two of your friends carry (i.e. heterozygoti per) the recessive allele of cystic fibrosis (c). Supposing that the frequency of this allele does not change with the increase of the population, what will be the incidence of cystic fibrosis on your island? PROBLEMA #8. There are 1,000 individuals of a large population for the MN blood group, which can be easily measured as it is co-dominancy (i.e., it is possible to detect heterozygotes). They are typed as follows: EDGEMENT OF SANGUE NUMBER OF INDIVIDUAL RESULTING MM 490 0.49 MN MN 420 0.42 NN 90 0.09 Using the above data, calculate the following: The frequency of each allele in the population. Supposing the couplings are random, the frequency of the couplings. The probability of each genotype resulting from each potential cross. PROBLEMA #9. Cystic fibrosis is a recessive condition that affects about 1 out of 2,500 children in the Caucasian population of the United States. Please calculate the following. The frequency of the recessive allele in the population. The frequency of the dominant allele in the population. The percentage of heterozygous individuals (porters) in the population. PROBLEMA #10. In a given population, only the alleles "A" and "B" are present in the ABO system; there are no individuals with blood type "O" or with alleles or in this particular population. If 200 people have type A, 75 type AB and 25 type B blood, what are the alleleic frequencies of this population (i.e., what are p and q)? PROBLEMA #11. The ability to taste PTC is due to a single allele dominated "T." You have sampled 215 individuals in biology, and you have established that 150 could detect the bitter taste of PTC and 65 no. Calculate all potential frequencies. PROBLEMA N. 12. (You will not have this type of problem at the exam) What allelica frequency will generate double the recessive homozygotes compared to heterozygotes? If you are viewing this message, it means we have problems loading external resources on our website. If you're behind a web filter, make sure the *.kastatic.org and *.kasandbox.org domains are unlocked. Unlock.