Purple flowers = (pp) or (pp) = 445 essay examples

Science, Genetics

Answer for Part 1

A: In the F1 generation there were 445 purple and 437 white flowers. If the homozygous dominant genotype is (PP) and heterozygous genotype is (Pp); then the recessive genotype would be (pp).

White flowers = (pp) = 437

The ratio of purple flowers to white flowers is nearly 1: 1, i. e. the number of purple flowers to the number of white flowers is nearly same. Hence, the parents would heterozygous purple flower (Pp) with homozygous recessive (pp). The following is an example of a test cross.

B: In genetics, a test cross, first introduced by Gregor Mendel, is used to determine if a group exhibiting a dominant trait is homozygous or heterozygous for that trait. More simply put, test crosses determine the genotype of an individual with a dominant phenotype. Test crosses involve breeding the individual in question with another individual that expresses a recessive version of the same trait. If all offspring display the dominant phenotype, the individual in question is homozygous dominant; if the offspring display both dominant and recessive phenotypes, then the individual is heterozygous.

In some sources, the " test cross" is defined as being a type of backcross between the recessive homozygote and F1 hybrid or F2 hybrid crossed with recessive parent is said to be a test cross. The ratios in test cross are always equal e. g.; if a heterozygous purple (Pp) is crossed with homozygous white, and then 2 gametes formed will be Pp and pp. It means 50% flowers will be of purple colour and 50% flowers will be of white colour. The test cross

follows the " First Law" of Mendelian genetics which is also called as Law of Segregation. The Law of Segregation states that every individual possesses a pair of alleles (assuming diploidy) for any particular trait and that each parent passes a randomly selected copy (allele) of only one of these to its offspring.

Answer for Part 2

If the purple flowered plants from this F1 generation were self fertilized then all the ratio of purple flowers to white flowers would be 3: 1. The probability of purple flowers is ¾ and probability of white flowers ¼. The genotypic ratio would 1 homozygous dominant (PP): 2 heterozygous (Pp): 1 homozygous recessive (pp)

Answer for Part 3

A: If the purple tall plant is crossed with a white dwarf plant, then the probability of white dwarf plant would be 1/16. The phenotypes in the F2 generation shall be: Purple tall = 9/16; Purple dwarf = 3/16; White tall = 3/16 and White dwarf = 1/16.

B: The pattern observed in the following example is the " Second law" of Mendelian genetics. It is called as the Law of Independent Assortment. The Law of Independent Assortment, also known as " Inheritance Law", states that separate genes for separate traits are passed independently of one another from parents to offspring. The biological selection of a particular gene in the gene pair for one trait to be passed to the offspring has nothing to do with the selection of the gene for any other trait. More precisely, the law states that alleles of different genes assort independently of one another

during gamete formation. While Mendel's experiments with mixing one trait always resulted in a 3: 1 ratio; between dominant and recessive phenotypes, his experiments with mixing two traits (dihybrid cross) showed 9: 3: 3: 1 ratios. However, the 9: 3: 3: 1 table shows that each of the two genes is independently inherited with a 3: 1 phenotypic ratio. Mendel concluded that different traits are inherited independently of each other, so that there is no relation, for example, between a color of the flower and the height of the plant. This is actually only true for genes that are not linked to each other.