

VERIFICATION OF MENDELIAN RATIO USING CHI-SQUARE ( $\chi^2$ ) TEST.  
(PAPER: ZOOG-CC4-4-P)

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**HOME WORK**

1. Expecting a Mendelian monohybrid cross ratio of 3:1, a geneticist crossed pure bred tall and dwarf pea plants, and out of 100 progeny he obtained 787 tall and 277 dwarf plants in F<sub>2</sub> generation. Construct the null (H<sub>0</sub>) and an alternative hypothesis (H<sub>a</sub>) and use Chi square test for goodness of fit to conclude whether the geneticist can conclude as he expected or not.
2. In a cross between tall and dwarf garden pea plants 350 tall and 110 dwarf pea plants were obtained in F<sub>2</sub> generation. Test the goodness of fit of these data to a 3:1 ratio, using the Chi square test considering probability at 5% level of significance.
3. In his experiments with peas, Gregor Mendel observed that 315 were round and yellow, 108 round and green, 101 were wrinkled and yellow, and 32 were wrinkled and green. According to his theory of heredity, the number should be in the proportion 9:3:3:1. Is there any evidence to doubt his theory at the (i) 0.01 and (ii) 0.05 significance level?
4. In a cross between heterozygous tall plant with round seed coat pea plants and homozygous dwarf plant with wrinkled seed the following phenotypes were obtained in F<sub>2</sub> generation. Tall-round = 200, Tall- wrinkled = 190, dwarf-round = 180 and dwarf-wrinkled = 170. Test the goodness of fit considering suitable null hypothesis using the Chi square test considering probability at 5% level of significance.

**Remember:**

If level of significance is not specified then consider it as 0.05 or 5% level.

**NOTE:**

**STUDENTS ARE DIRECTED TO DO THE SUMS AND COMMUNICATE WITH ME TO MEET THEIR QUERIES (AND TO GET THE ANSWER OF THE ABOVE PROBLEMS) AFTER THOROUGH READING OF THE PDF CONTAINING TWO SOLVED PROBLEMS.**