

CHAPTER 10 (Test #3)

Goodness of Fit

3. According to one geneticist's theory, a crossing of red and white roses should produce offspring that are 25% red, 50% pink, and 25% white. An experiment conducted to test the theory produced 30 red, 78 pink, and 36 white offspring. Test the geneticist's claim. Provide a one sentence statement to accompany your conclusion. Can we prove the geneticist's claim? Explain.

Claim → Ho: $P_1 = .25, P_2 = .50, P_3 = .25$
 H1: at least one proportion is not equal to the given proportions

$\alpha = 0.05$ (choose 0.05 as no significance level is given)

$n = 144 \quad k = 3$

Color	Red	Pink	White
Observed	30	78	36
Expected	36	72	36
	$.25 \times 144$	$.50 \times 144$	$.25 \times 144$

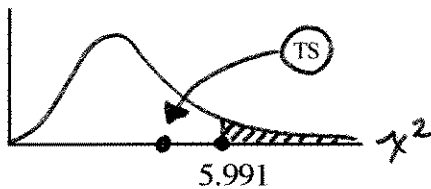
Test Statistic

$\chi^2 = \sum \frac{(O - E)^2}{E} \quad \chi^2 = \frac{(30 - 36)^2}{36} + \dots + \frac{(36 - 36)^2}{36} = 1.5$

P-Value ≈ 0.472

Fail to Reject Ho

Critical Value $df = 1 \quad (r-1)(c-1)$



There is not sufficient evidence to reject the claim that a crossing of red and white roses should produce offspring that are 25% red, 50% pink, and 25% white.