

1. In 1980 Steel and Torrie (*Principles and Procedures of Statistics*) reported leafburn time (seconds) for 30 tobacco leaves, for which percent nitrogen, chlorine, and potassium had been measured. Does leafburn depend on chemical composition? Assign symbols to variables. Assume all variables are cardinal (not categorical) then write a general linear model to address this question.

Name	Symbol
_____	_____
_____	_____
_____	_____
_____	_____

Source	df

GLM _____ = _____

Complete the first two columns of the ANOVA table (above).

2. For a 2 allele locus we let p = frequency of one allele in the parental generation, and $q = 1 - p$ = the frequency of the other allele. At Hardy Weinberg equilibrium, the expected proportion of homozygous and heterozygous offspring is given by

$\hat{p} = (p+q)^2 = (p^2 + q^2) + 2pq$
 where $(p^2 + q^2)$ is the expected frequency of homozygous offspring
 $2pq$ is the expected frequency of heterozygous offspring.

For 1000 offspring, compute the expected proportion (\hat{p}) of homozygous and heterozygous offspring at Hardy-Weinberg equilibrium, when $p = 0.3$ in the parents. Compute the expected frequency $\hat{f} = 1000 \hat{p}$.

$\hat{p} =$ _____	homozygous	$\hat{f} =$ _____
_____	heterozygous	_____

3. Compute the goodness of fit G for the following frequencies of offspring relative to Hardy -Weinberg equilibrium with $p = 0.5$ in the parents.

$G = 2 \sum f \ln(f / \hat{f})$ where \hat{f} is the value expected from theory.

Expected \hat{f}	Observed f	
<u>50</u>	<u>48</u>	heterozygous
<u>50</u>	<u>52</u>	homozygous