PROBLEMS FOR STAT 261, DUE FEBRUARY 16, 2007

1) In Gregor Mendel's famous experiments in pea breeding, his model included the supposition that yellow and green coloured seeds were variants (now called "alleles") of the same gene, and that yellow is dominant, so that heterozygotes with one yellow and one green allele would show the green colour. (Homozygotes, with two yellow or two green alleles, would have the corresponding colour.) He started with peas that should all have been heterozygotes, and crossed them with each other to produce "second-generation hybrids".

a) Under the assumption that each parent passes on one of its two alleles independently and with equal probability to the offspring, what should have been the distribution of colours of the second-generation hybrid seeds?

b) Mendel obtained 8,023 second-generation hybrid seeds, of which 2001 were green, and 6,022 were yellow. Is this consistent with his model?

2) Evans & Rosenthal p. 326, 6.3.6.

3) Evans & Rosenthal p. 326, 6.3.8.