

EXERCISES FOR CHAPTER 13

Exercise 13.1. For the Eberhart-Gardner general genetics model, let us consider two loci, A and B , with only two alleles at the A locus, but with three alleles at the B locus which show partial dominance to each other in the increasing direction. Put together a numerical example similar to Example 13.1, pp. 13.4 to 13.7, to illustrate the general model. Note the meaning of the effects and their restrictions discussed at the end of Section 13.1 (end of Example 13.1). Use the same numerical values that are appropriate in Example 13.1, namely,

$$\begin{aligned}\mu' &= 100 \\ \alpha_{A_1} &= 9, \alpha_{A_2} = -9, \delta_{A_1A_2} = 7 \\ (\alpha\alpha)_{A_1B_1} &= 4, (\alpha\alpha)_{A_1B_2} = 1, (\alpha\alpha)_{A_2B_1} = -3, (\alpha\alpha)_{A_2B_2} = -2,\end{aligned}$$

Use nonzero integers for all effects.

Calculate the genotypic values of the six double homozygotes, the nine single heterozygotes, and the three double heterozygotes. Be sure that all conditions are satisfied.

Exercise 13.2. Write up a 10 to 20 point question that you would consider appropriate to give in this course in another year. Give a question that is not directly embodied in these notes, but would require the students to make some interrelationships or extensions on their own. Also supply the answers to your question. The question will be graded in part upon depth of thought involved.