

Homework no. 3
Due Wednesday, April 18

1. (13 points) [Exercise 10, Chapter II, altered some.] Suppose three genotypes A_1A_1 , A_1A_2 , and A_2A_2 have fitnesses 4, 0, and 3. What is the equilibrium gene frequency? Is it stable? Why can't we just use the formulas for the fitnesses $1 - s : 1 : 1 - t$? *Hint: the ratio p_1/p_2 might be a useful thing to follow.* [In addition, this too:] What is the formula for the mean fitness \bar{w} as a function of p , for these fitness values? Find where it is at a minimum, by looking at its slope.
2. (12 points) [Exercise 13, Chapter II, slightly clarified] Suppose that exactly once every ten years a haploid desert plant experiences a wet year. If genotype A has, relative to a , fitness 2 during wet years and 0.92 during dry ones,
 - (i) what is the arithmetic mean relative fitness of A ? The geometric mean relative fitness? *Be sure to weight things properly.*
 - (ii) what will happen to the frequency of A over the long run?