Fundamentals of Ecology ESS/BIO 148   Name_____
Homework 2
                                                       Section_____

The following is a payoff matrix for two competing phenotypes within the same species. One phenotype (red) is aggressive… the other phenotype (black) declines confrontation. Given the awards defined by the payoff matrix, and the fact that the red phenotype represents 83% of the population, answer the following questions.

<div align="center">

Player 2

		Red	Black
	Red	6	2
Player 1			
	Black	7	4

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1) Write the fitness equation and calculate the expected fitness values for both the red and black phenotypes.

2) What is the likely outcome of competition between the two phenotypes? Which will dominate?

3) The population N(t) grows exponentially (and is continuous). The starting population size has 100 individuals, and an intrinsic growth rate r=0.02. How much time will it take for the population to reach 10x its initial size? Show your work.

4) Answer the same question as 3), but assuming that the population changes over discrete time increments.