1. Problem 1 (10 points)

An epidemic hits our favorite mammal to model: bunnies. As a result, the bunnies can no longer reproduce. The death rate is proportional to the population of the remaining bunnies.

(a) Write the differential equation for the population $P(t)$ of rabbits at time $t$.

(b) Assuming that $P(0) = P_0$, solve the initial value problem.

(c) Suppose that when the epidemic hits at $t=0$, there are 1500 rabbits. Six months after crisis strikes, there are only 500 rabbits remaining. How many rabbits will be alive in 12 months ($t=12$)?