Math 221 Quiz 4

Name:_____ Score:_____

Instructions: You must show supporting work to receive full and partial credits. No text book, notes, formula sheets allowed.

1(5pts) For the equation $\frac{dx}{dt} = a - bx$ with $a > 0, b > 0$ being parameters, sketch the following graphs: (i) the equation portrait (in x v.s. dx/dt), (ii) the phase portrait (also called the phase line), and (iii) a solution portrait (in t v.s. x).

2(5pts) If the rate of a population growth is proportional to the population squared, and the initial population is $P(0) = P_0$, find the population $P(t)$ at time t.

END