You need to answer all three questions on this exam.

You have until 5 PM to finish, though it probably will not take you that long. Answer the questions using as much precision and detail as the time allows.

The questions are equally weighted.

Answer all of the following three questions.

1. [**35 points.**] What makes the derivation of the the Hotelling Rule for a competitive industry much more difficult than the derivation of the Hotelling Rule for a monopoly?

   Attachment 1 to this exam may help in answering this question.

2. [**50 points.**] In the 11-page typewritten handout on fisheries economics (Attachment 2 to this exam), the first paragraph of Section 3 deals with private-property competition in schooling fisheries.

   Suppose F takes the logistic form $rx(1 - x/K)$.

   Illustrate the *dynamic* evolution of this system, using a phase diagram. You do not have to re-derive any formula you find in my fisheries handout.

   There are two cases you should consider: in the first, the intrinsic growth rate is less than the rate of discount; in the second, the intrinsic growth rate is more than the rate of discount.

   It is not interesting to consider the case in which costs are so high that profit is always negative. It is also not interesting to consider dynamic paths in which profit is always negative.

3. [**15 points.**] Suppose Georgescu-Roegen were alive today, and someone asked him: "what is the optimal policy to combat global warming?" How do you think he would respond?