EC 390 Problem Set 02

Instructions: Answers must be submitted online through the designated Canvas assignment in a **PDF file**. Any other file type is not allowed. This Problem Set is due on **October 22 at 11:59am**. Please write as legible and clearly as possible. You will not be given full credit if your answers cannot be easily understood.

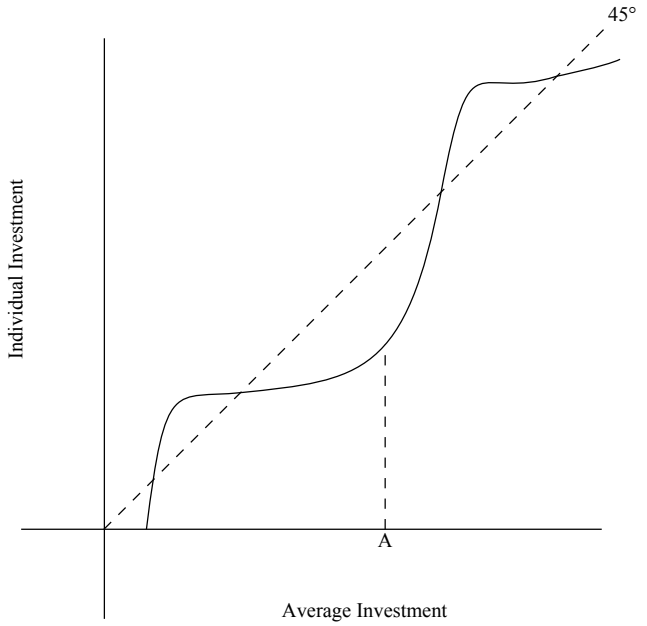
Questions

1. [10 points] **True or False?** Firms with new and better technology will always be able to force existing (incumbent) firms with old technology out of the market. Explain (Be brief in your explanation). Use a **graph** to demonstrate your argument.

2. [5 points] Consider the Solow model discussed in class. In this country, **women's labor force participation** increases which, in turn, reduces fertility rates in the country. At the same time, since there are fewer dependents, households **can save more**. Show graphically what happens to **capital per worker** (k) and **output per worker** (y).

3. [2 points] When one agent's actions provide an **incentive** for other agents to take similar actions, we say that there are _____ between these actions

4. Consider the following S-curve diagram:

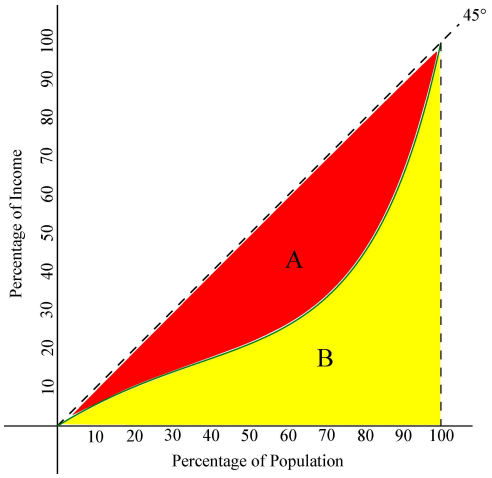


(a) [2 points] Label the equilibrium points on the graph (Make sure they are identifiable and named)

(b) [3 points] Classify each equlibrium as **stable or unstable**

(c) [5 points] Suppose that average investment is currently at point A. Where will average investment end up? **Show the dynamics on the graph by drawing arrows**

5. Consider the following Lorenz Curve



(a) [2 points] Describe how the **Lorenz Curve** would change if the society had **perfect income equality**

(b) [2 points] Describe how the **Lorenz Curve** would change if the society had **perfect income inequality**

(c) [4 points] If the we have the area of $A = 0.15$ and the area of $B = 0.35$, what is the **Gini Coefficient** for this society? **Show your work**

Points earned: _____ / 8 points

6. Consider the O-Ring model. It predicts that there will be a strong tendency for the most productive workers to work together. Let there be 6 workers and 2 firms, where each firm hires 3 workers total. There are 3 high-skill q_H workers and 3 low-skill q_L workers, such that $q_H > q_L > 0$. Workers can be assigned in either **sorted groups** or **mixed groups**:

   - **Mixed Assignment:** Firm 1 hires (q_H, q_H, q_L) and Firm 2 hires (q_H, q_L, q_L)
   - **Sorted Assignment:** Firm 1 hires (q_H, q_H, q_H) and Firm 2 hires (q_L, q_L, q_L)

   (a) [5 points] Compute the total output under each **type of assignment**

   (b) [10 points] Show **algebraically** that the sorted assignment yields striclty higher total output whenever $q_H > q_L$