1. (25) Assume a duopoly where firms compete in quantities (Cournot). Assume in the infinitely repeated setting they engage in the “trigger” strategy we discussed in class. That is they “fix” things so each firm has a profit of \( \pi^M = 1800 \), which exceeds the Cournot profit of 1600. If one firm deviates from this, it receives a profit of 2025, but then this firm’s competitor will go back to playing Cournot thereafter.

(a) At what range of discount factors is this trigger strategy sustainable?

(b) How does your answer change if firms resort to Bertrand competition if one firm deviates from the fix, and profits from deviating are 3600?

2. (25) Consider the measures of market concentration \( C_n, H \) discussed in class.

(a) Which of these measures have the property of **monotonicity**—that is if we have \( n \) identical firms, concentration is decreasing in \( n \). Justify your answer.

(b) Which of these measures have the property of **cardinality**—that is if we divide each firm into \( k \) smaller firms, then concentration decreases in the same proportion.

3. (25) An Eco 188 prof becomes so sick of faculty meetings that he resigns and opens up a nightclub. The club has both student and adult customers. The demand for drinks by a typical student is

\[ Q^S = 18 - 3P \]

and the demand for drinks by a typical adult is

\[ Q^A = 10 - 2P \]
There are equal numbers of students and adults. The marginal cost of each drink is $2. Suppose the owner can “card” patrons and determine who among them is a student and who is not, and in turn can serve each group by offering a cover charge and a number of drink tokens to each group.

(a) What will be the cover charge and number of tokens be for students?
(b) What will be the cover charge and number of tokens be for adults?