1. Consider a homogenous good market with the following market demand curve:

\[ q = 8 - p, 0 \leq p \leq 8 \]
\[ = 0, p > 8. \]

Two firms produce output at constant marginal cost which may differ between the two firms. The marginal cost of firm 1 is 1 while that for firm 2 is 2. Firms engage in Cournot quantity competition. Derive the Nash equilibrium outcome and the profits of the two firms. Explain how and why the outcome differs from the case where the firms engage in (Bertrand) price competition.

2. Consider an infinitely repeated Bertrand oligopoly with identical firms and constant marginal cost. Explain rigorously the economic intuition behind the hypothesis that

(i) lower market concentration (higher number of firms)
(ii) higher turnover (entry and exit of firms)
(iii) declining industry demand

make it more difficult for collusion to take place.

3. "Collusive agreements among private firms that lead to cartels often need to be self-enforcing". What is the meaning of "self-enforcing? Why do such agreements have to be self-enforcing?"