Problem Set 12 (due date: 03.02.2014)

1. A firm has developed a new product for which it has registered trademark. The firm's market research department has estimated that the demand for this product is $Q(P, A) = 11600 - 1000P + 20A^{1/2}$ where Q is the annual output, P is the price, and A is the annual expenditure for advertising. The total cost of producing the new good is $C(Q) = 0.001Q^2 + 4Q$. The unit cost of advertising is constant at $m = 1$.

a) Calculate the optimal output level Q^*, price P^*, and advertising level A^* for the firm.

b) What is the firm's profit if it follows this optimal strategy?

c) What is the consumer surplus if the firm adopts this strategy?

2. Discuss the quality choice of a monopolist, vertical product differentiation and the intensity of quality competition in an oligopoly. Discuss the following points:

a) What determines the level of quality provided by a monopolist? Is the provided quality too low or too high from a social perspective?

b) Under which conditions will a monopolist provide different qualities of a good? Why might the monopolist increase its profit by doing so?

c) Describe quality competition between several firms which might provide one quality of a good. Suppose that there exist (small) entry costs. What are the relevant determinates for the market structure in this setup? How does market size influence the equilibrium outcome?