1. (1 point) Suppose that you work for Archer Daniels Midland Company. ADM has recently acquired Minnesota Corn Processors (MCP). Your boss has asked you conduct a news conference to explain to the media how the acquisition of MCP will result in significant returns to scale in the production of ethanol, and that this will provide important benefits to Iowans. The media does not know what returns to scale are or what benefits might arise, so non-economists must understand your explanation. What will you tell the media?

2. (1 point) Suppose a farmer asks you how much fertilizer they should apply in order to maximize the profits from producing carrots. The price of fertilizes is $40 per kilogram. What advice would you give?
3. (1 point) A monopolist is considered to be a price maker. Explain intuitively how being a price maker affects the choice of how much output to produce.

4. (1 point) (i) What is a cost function, (ii) why is it increasing in output, (iii) why is it convex in output (convex means the cost function is increasing at an increasing rate)?

5. (2 points) Suppose there are 49 identical firms in perfectly competitive market. Each has a cost function given by \( c(q) = 18 + \frac{1}{2}q^2 \). The market demand is \( Q^D = 300 - P \). Derive the industry (long run) supply curve and solve for the equilibrium price and quantity in the market.
6. (2 points) Now suppose there is a single firm, a monopolist, in the market. The firm’s cost function is given by \( c(Q) = 18 + \frac{1}{2}Q^2 \). Market demand is \( Q^D = 300 - P \). Solve for the monopoly quantity and price.

7. (2 points) Suppose that an Iowa farmer and an agribusiness firm decide to grow and process and new strain of food grade soybeans. The agribusiness firm has agreed to pay the grower $10 per bushel for whatever he/she produces. It costs the agribusiness firm $2 per bushel to process the soybeans, and it expects a price of $14 in the consumer market. Thus, the agribusiness firm expects to earn $2 per bushel for processing the product, which it considers a fair return.

Suppose at harvest time, the consumer demand for the processed soybean product is much higher than anticipated. Instead of $14, consumers are willing to pay $20 per bushel for the processed product. There are no other supplies of the new strain of food-grade soybean available other than the production of the Iowa farmer.

Explain the hold-up problem facing the agribusiness firm (For full points, use the prices that are provided above in your answer.)