Microeconomics I
Assignment 3, 2022-2023

Prof. Roberto Sarkisian

T.A.: Sara Biadetti

An event that could have occurred with probability 0.5 either did or did not occur. A consulting firm must provide a report in the form of *"the event occurred"* or *"the event did not occur"*. The report's quality, or, in other words, the firm's product, denoted by q, is the probability that the report is correct. Each of k experts (input) prepares an independent recommendation that is correct with probability $1 > p > 0.5$. The firm bases its report on the k recommendations in order to maximize q.

(a) Calculate the production function $q = f(k)$ for $k = 1, 2, 3$.

(b) We say that a *discrete* production function is concave if the sequence of marginal products is nonincreasing. Is the firm's production function concave?

Assume that the firm will get a prize of M if its report is actually correct, and assume that the wage of each worker is w.

(c) Explain why it is true that if f is concave, the firm chooses k^* so that the k^{*th} worker is the last one for whom marginal revenue exceeds the cost of a worker.

(d) Is this conclusion true in our case? Why?