Homework 4 due date June 14
Stundet's Name:
Total Points: 100

Problem 1 (20 points):

Suppose $f(L,K) = K^2 + LK + L^{1/2}K^{1/2}$. Does this production function exhibit increasing, decreasing or constant returns to scale? Show your work.

Problem 2 (20 points):

Suppose $f(L,K) = KL^9$ $w = 1, r = 2$. $MPL = 9L^8K, MPK = L^9$. How much labor and capital should the firm hire if it wants to produce 10 units of output while minimizing its cost of production? Show your work.

Problem 3 (20 points):

Suppose $f(L,K) = \min\{2K, 5L\}$. $w = 1, r = 2500$. Derive the cost function. Show your work

Problem 4 (25 points):

Suppose we have a perfectly competitive market with price p. A typical firm has $VC(q) = q + aq^2$ and F (fixed cost). $MC(q) = 1 + 2aq$. a is a constant such that $a > 0$.
a) (5 points) Derive expressions for AVC and AC
b) (5 points) What is the range of prices for which the firm would shut down? Explain.
c) (5 points) What is the supply function for the firm?
d) (8 points) Suppose $p = 3$. Calculate firm's profits as a function of a. Show your work.
e) (2 points) How do profits calculated in part d change with a? Explain.

Problem 5 (15 points):

Suppose there are n identical firms each having a supply function $p = aq^2$. What is the market supply function? Show your work.
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