COMM/FRE 295
Assignment #1 (Due June 3)

Question #1

Suppose newsprint is produced in a perfectly competitive market by many identical firms. Each firm (including potential entrants) has a total variable cost $VC(q) = 40q + 0.5q^2$. Each firm's fixed cost is equal to $50.

a) Assuming that the fixed cost is entirely ***non-sunk*** (i.e. recoverable), calculate the price below which the firms will not produce any output in the short run.
b) Assume that there are 12 identical firms in this industry. Currently the market demand for newsprint is $Q_d = 360 - 2P$. What is the short-run equilibrium price?
c) Assuming the same market demand as in part (b), calculate the competitive long-run equilibrium. (i) quantity produced by each firm, (ii) price, (iii) total industry demand, and (iv) number of firms.
d) If the government imposes a tax t = $5 per unit of newsprint production, how will your solutions to part (c) change?

Question #2

5. Wheat is produced according to the production function $Q = 100(K^{0.8} L^{0.2})$ where Q denotes output, K denotes capital and L denotes labor.

(a) Beginning with K = 4 and L = 49, show that the MP of K and L are both decreasing. Show that this production function exhibits a diminishing MRTS.
(b) Does this production function exhibit increasing, decreasing or constant returns to scale? Show the mathematics you used to arrive at your answer.
(c) With capital fixed at 4 units, derive an expression for the MP of labor and AP of labor. Graph your expressions for MP_L and AP_L (L on the horizontal axis).
(d) If w =10 and r = $5, find cost minimizing combination of K and L to produce 5000 units of Q. Draw a graph to illustrate your result.