ECO 401-002
Spring 22003
Problem Set #5

Due: Tuesday, April 1

1. After Burton Denson graduated with honors from the American Trucking
    Academy, his proud (and rich) parents gave him a new $350,000 tractor-trailer
    rig. At a recent class reunion of ATA alums, Burton boasted to some fellow
    truckers that his revenues were typically $25,000 per month, while his operating
    costs (fuel and maintenance) amounted to only $18,000 per month. The other
    truck drivers are all employees of various trucking companies, and bemoaned the
    fact that they are only averaging $5,000 per month in salary and benefits, while
    Burton is taking home $7,000. They wish that they had rich parents so that they
    could be in business driving their own rigs like Burton. Since you are attending
    the class reunion with your spouse, who is also an alum of the ATA, you overhear
    this conversation. Your spouse turns to you and says, "OK Mr./Ms. Economics
    major, I'm driving trucks across the country to put you through school, what do
    you think of this guy's reasoning? Why don't we take the $350,000 we have in
    mutual funds and cash it in, and buy me a rig of my own. Then I can quit driving
    for J. B. Hunt Trucking Co. and work for myself like Burton." How do you
    answer your spouse? (Hint: this questions calls for an evaluation of the economic
    profitability of being an independent trucker.)

2. Use the information in Table 7.1 on page 167 of Browning and Zupan. If the
    rental rate per unit of capital is $5 and the wage rate per unit of labor is $3,
    calculate TFC, TVC, and TC for outputs 0, 5, 18, 30, 40, 45, 48, and 49. Put your
    answers in a table, and then graph the TFC, TVC, and TC curves. Next calculate
    AFC, AVC, and ATC for the same outputs, put your answers in a table, and then
    graph the AFC, AVC, and ATC curves. Then calculate and graph MC.

3. Suppose the rental rate per unit of capital is $10, and the wage rate per unit of
    labor is also $10. Using the isoquant map in Figure 7.5 on p. 181, assume that the
    firm's expansion path is give by the ray R. Graph the firm's long-run total cost
    curve and long-run average cost curve.

4. You find that when you use 8 quarts of insecticide in combination with 16 lbs. of
    fertilizer, you are able to produce 45 lbs. of zucchini squash in your garden. If you
    use 22 lbs. of fertilizer, output rises to 50 lbs. of zucchini. If you then cut back on
    insecticide to 6 quarts, zucchini output falls back to 45 lbs. (a) Draw the isoquants
    corresponding to 45 and 50 lbs. of zucchini. (b) What is the marginal rate of
    technical substitution between fertilizer and insecticide between the two points that
    you have on the isoquant for 45 lbs. (c) Given that MRTS, suppose that you are
    minimizing cost. If insecticide is $3 per quart, what must be the price of a lb. of
    fertilizer?