

PPA 730-10: Fundamentals of Policy Analysis
 Cost, production, and competition SOLUTIONS

I. Cost and production

For my firm, I face wages of \$100 per worker. My rent, which is fixed, is \$100 as well.

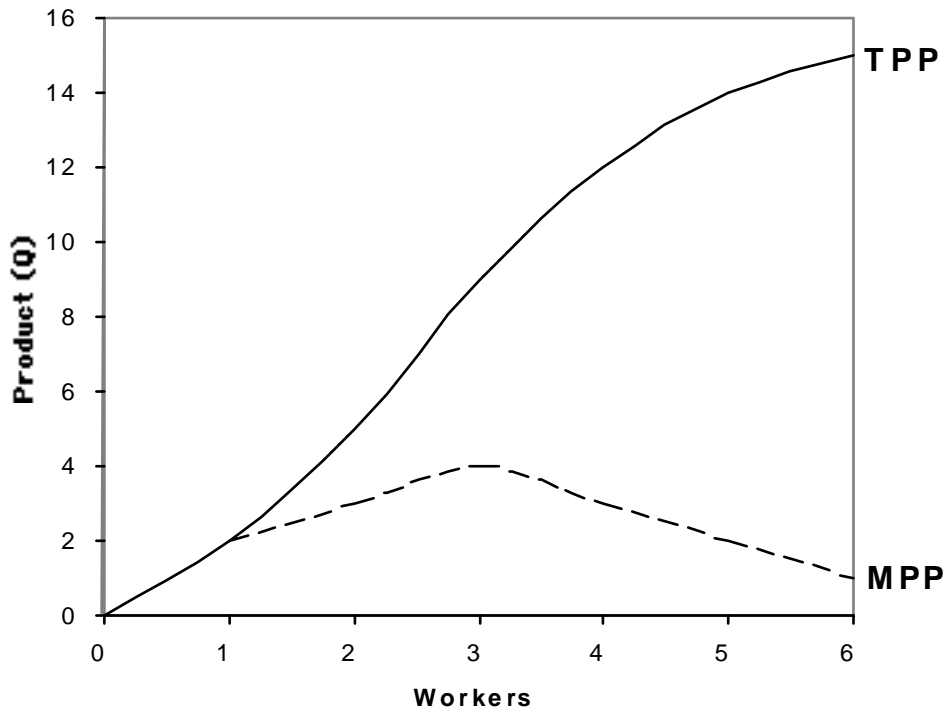
In this problem, the variable costs are wages. The fixed cost is rent.

1. Fill in the matrix below.

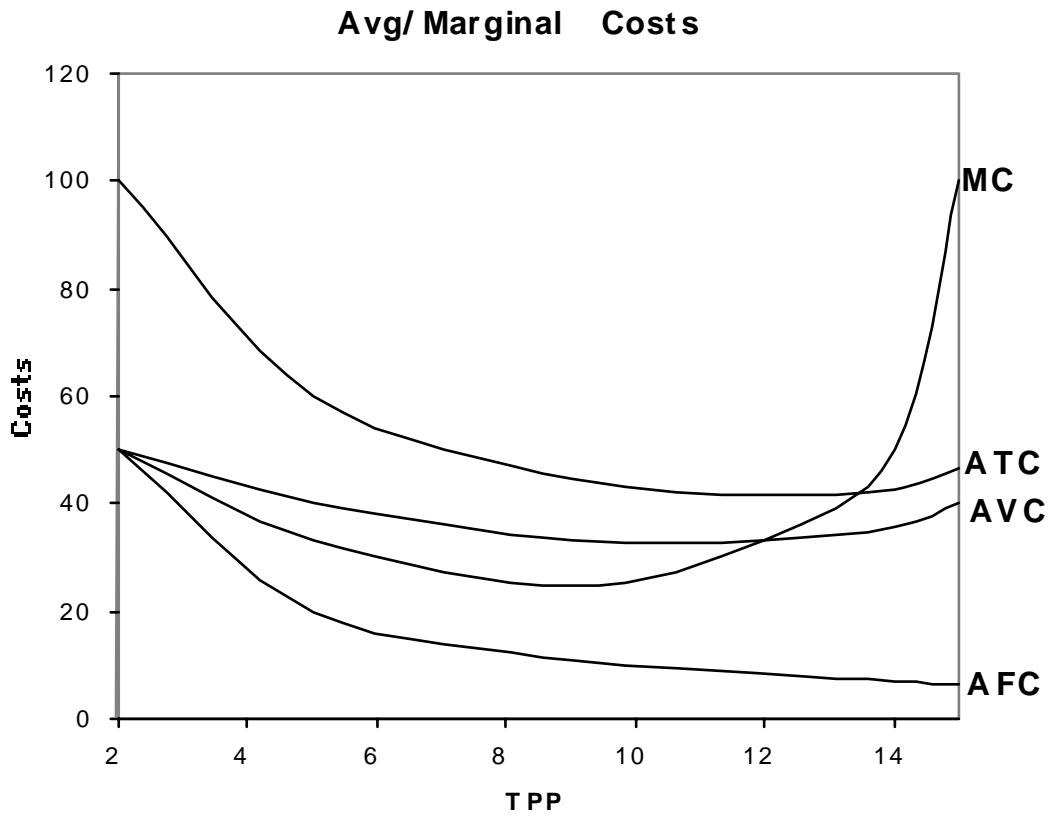
workers	TPP	MPP	TVC	TFC	TC	MC	AVC	AFC	ATC
0	0	--	0	100	100	--	--	--	--
1	2	2	100	100	200	50.00	50.00	50.00	100.00
2	5	3	200	100	300	33.33	40.00	20.00	60.00
3	9	4	300	100	400	25.00	33.33	11.11	44.44
4	12	3	400	100	500	33.33	33.33	8.33	41.67
5	14	2	500	100	600	50.00	35.71	7.14	42.86
6	15	1	600	100	700	100.00	40.00	6.67	46.67

2. Draw the production curves.

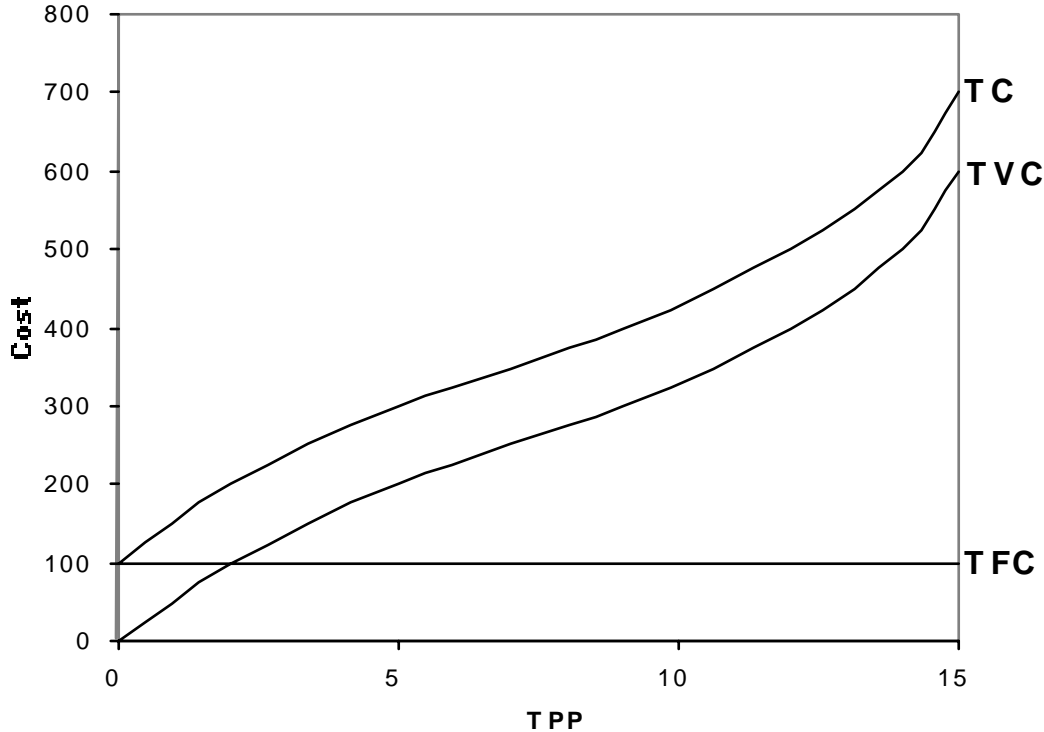
Production curves



3. Draw the cost curves.



Total Cost Curves



4. Over what range of workers do I see increasing marginal returns? Diminishing marginal returns?

Increasing: 0-3
Diminishing: 4-6

II. Diminishing marginal returns

The mayor's office, in an effort to make Syracuse's Clinton Square more inviting, decided some time ago to grant licenses to individual street vendors. The notion was that these vendors would make the region more interesting, friendly, and diverse through the interaction of passersby and enterprising small businesspeople. This might even draw in some "cultural tourism." Looking at the way things are functioning at present, the mayor is not pleased, however. There are so many vendors selling their wares that tourists are being harassed and driven away, and there are increasing security problems. It seems like every day there is a fistfight between vendors. The local residents are complaining loudly that their neighborhood is a worse place to live than it was before the vendors came. Considering the problem, the mayor remarks that "we may have reached diminishing returns with this policy." Do you agree with his use of this concept? If not, explain to him how he is misusing it, in terms that are specific to this problem. Be clear and nontechnical. 1 paragraph maximum.

The mayor is mistaken. What he means is that the city is experiencing *negative* returns from this policy. Diminishing returns suggests that each additional vendor increases the total city well-being over the last, but by less and less. Since the city is suffering lower well-being with the current number of vendors than if there were fewer, the returns are actually negative.

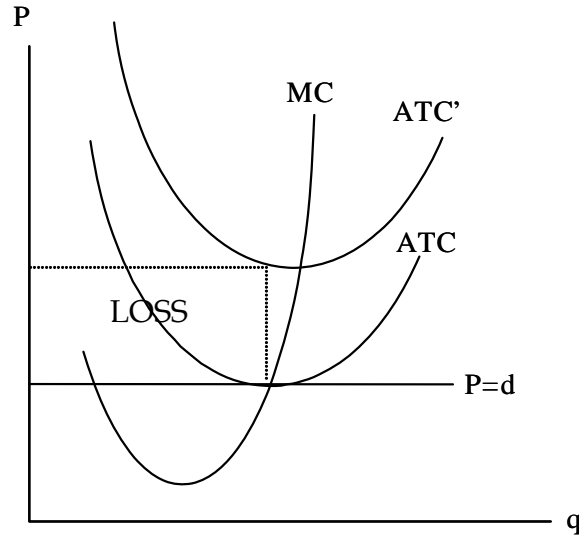
III. The problem with spending funds on research

Firms in industries such as pharmaceuticals and biotech exist in a highly-competitive environment. However, R&D is key to advances in these industries. Firms claim that if they are not shielded from

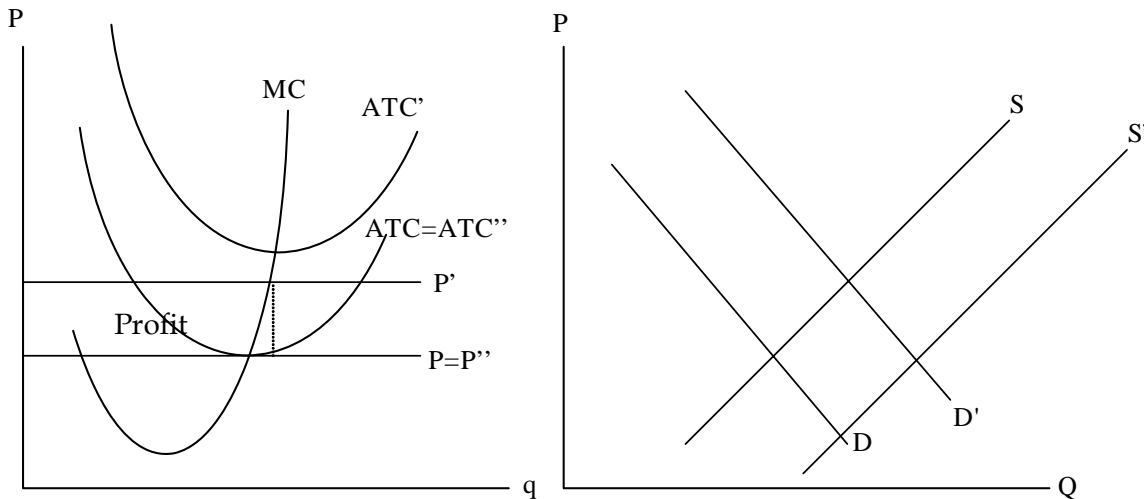
Problem set #3

competition when they innovate, they will lose money—and hence not innovate. Policymakers usually think this would be bad for the economy in the long run.

1. Assume perfect competition. Imagine that Brain-o-Tech, a biotech firm, undertakes expensive genetic research to develop a cabbage that tastes good and also increases your concentration. Graph its SR profit (loss) position. Make sure the average and marginal curves are clear.



2. Assuming the research pans out, it leads to the fabulous cabbage. Production costs fall to the same level as for the old cabbages. The improved cabbage greatly increases the industry's customer base. Graph the short-run effects of this.



3. Existing competitors were able to freeride on Brain-o-Tech's R&D. In the long run, Brain-o-Tech complains that what little short-run profits there were will have disappeared. Graph this. Explain what happened to the profits in a few sentences.

First, average costs rose from ATC to ATC' when Brain-o-tech undertook the R&D. This led to a loss. However, it stimulated the market from D to D'. In the short-run, Brain-o-tech enjoyed profits resulting from the increase in P to P'. In the long run, however, firms, freerode on the R&D,

entering the market established by Brain-o-tech's research to get the "free" profits. This increased supply from S to S' , driving price back down to $P''=P$, and profits back to zero.

IV. University finances

Some people have argued that it is reasonable to use the perfectly competitive model to examine the pricing/profit/operations decisions of colleges and universities.

1. We all know that no market exactly fits a model's assumptions. Briefly, in what way(s) does the university system violate the assumptions of perfect competition? (4 sentences)

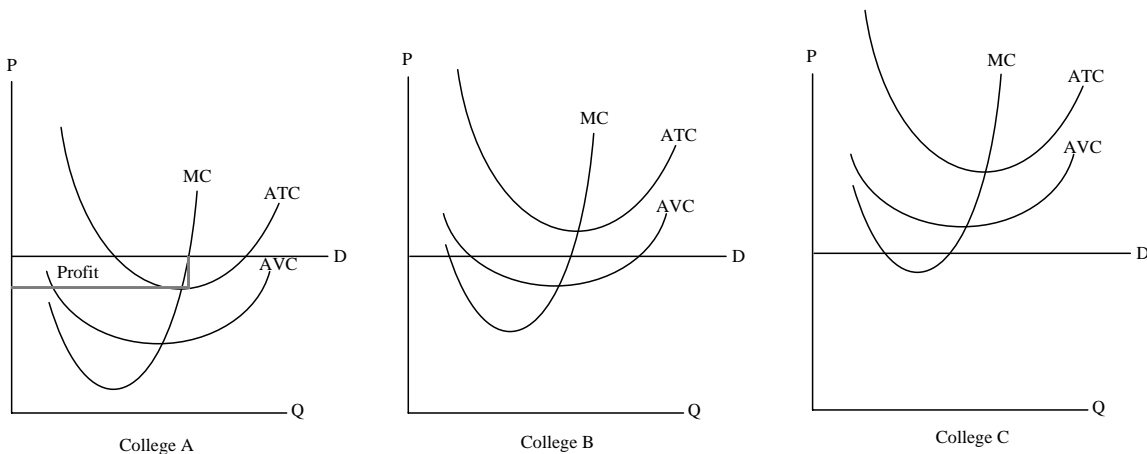
- **There is not an infinite number of students or universities**
- **Information is imperfect: quality and price are not known for all universities by all students**
- **Starting a university is expensive: this is a barrier to entry**
- **The good is heterogenous: SU's product differs from Harvard's, for example.**

Assume that its market is perfectly competitive.

2. College A is earning a SR profit. Draw in a demand curve that denotes this. Indicate the Q (number of students) that maximizes its profit. Indicate (graphically) the amount of profit earned.
3. College B has higher costs than College A, and is earning a SR loss. However, it chooses to operate anyway, in the SR (assume that College B is rational and behaves according to microeconomic theory). Draw in a demand curve that denotes its situation. Indicate the Q (number of students) that minimizes its losses. Indicate (graphically) the amount of (negative) profit. Explain in one sentence why it chooses to operate even though it is earning a loss.

By operating in the SR, it earns back its variable costs and defrays some of its fixed costs.

4. College C has astronomical costs, and shuts down immediately. Draw in a demand curve that denotes this.



V. State agricultural policy mystery

Problem set #3

You are a policy consultant to the Mississippi Governor's office. The Governor won re-election last year, in a campaign in which one of his promises was to "protect our state's cotton farmers' way of life." By this he meant that he was going to intervene in the market somehow to increase cotton farming incomes. Before you were hired, it was decided that a good way to implement this policy was for the state government to buy large quantities of cotton and resell them at a loss in Mexico.

One month after the program began, the policy seemed a success: cotton prices were higher and cotton farmers were earning a better living, on average. One year after the program began, however, the situation seemed quite different: Cotton was back at its old price, and while there seemed to be a lot of farmers growing cotton (perhaps even more than before the policy), they were making the same meager living as before the policy was implemented in the first place. And on top of all that, the state was spending a lot of money by buying cotton and selling it at a loss.

The governor says to you: Tell me why this policy is a failure—why are we buying all this cotton but farmers aren't doing any better than before?

1. Assume for your analysis that the cotton industry is perfectly competitive. Graph what happened and it in words to an economist. Make sure all of the steps in your analysis are clear.

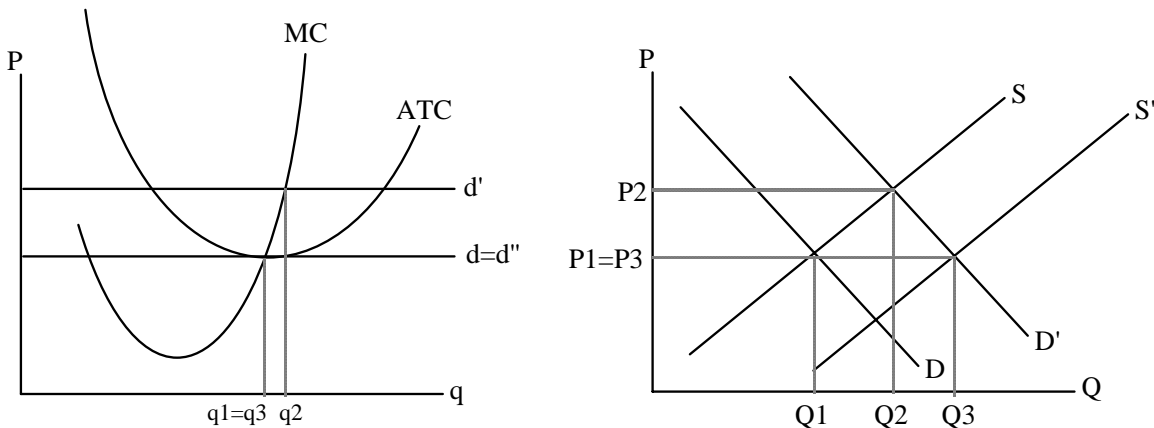


Figure III.1

Here is the right sequence of events, illustrated in the figure above:

- State policy raises demand for cotton (note: no change in supply yet!)
- Prices and profits are driven up in the SR
- In the LR, farmers enter the cotton market to realize these nice high profits
- Rising aggregate supply drives up quantity, drives down price
- Entrance into cotton market stops when profits equal zero again

2. Now explain what happened in words only to a non-economist, the governor himself. No jargon, and maximum 2 paragraphs..

Same as above, but without jargon.