Homework 5 – Answer Key

1. You own a snow shoveling business. The table below shows the number of driveways that can be shoveled per snowstorm depending on how many workers you hire.

<table>
<thead>
<tr>
<th># of Workers</th>
<th># of Driveways Shoveled</th>
<th>Marginal Physical Product</th>
<th>Marginal Revenue Product (P=$10)</th>
<th>Marginal Revenue Product (P=$20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
<td>$100</td>
<td>$200</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>9</td>
<td>$90</td>
<td>$180</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>8</td>
<td>$80</td>
<td>$160</td>
</tr>
<tr>
<td>4</td>
<td>34</td>
<td>7</td>
<td>$70</td>
<td>$140</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>6</td>
<td>$60</td>
<td>$120</td>
</tr>
<tr>
<td>6</td>
<td>45</td>
<td>5</td>
<td>$50</td>
<td>$100</td>
</tr>
<tr>
<td>7</td>
<td>49</td>
<td>4</td>
<td>$40</td>
<td>$80</td>
</tr>
<tr>
<td>8</td>
<td>52</td>
<td>3</td>
<td>$30</td>
<td>$60</td>
</tr>
</tbody>
</table>

a. What is the marginal physical product of the 6th worker? Explain in words what that means.
Marginal physical product is the extra output that can be made if one more worker is added. I have included a column in the table that shows marginal physical product. The marginal physical product of the 6th worker is 5. This means that by having 6 workers instead of 5 workers, 5 more driveways can be shoveled.

b. You get paid $10 for every driveway that gets shoveled. If you have to pay your workers $80 per day, how many workers would you be willing to hire? Explain.
You want to hire workers as long as their marginal revenue product (the extra cash they bring in to the business = marginal physical product * price of the product) is more than the wage you are paying them. I have included a column in the table that shows marginal revenue product when price is $10. You want to hire 3 workers. Each of these workers brings you more (or as much) extra revenue as the wage you pay the worker. You aren’t willing to hire the 4th worker because you would have to pay the worker $80 but the worker only brings you $70 more revenue – your profits would be lower if you hired the 4th worker.

c. If the price of shoveling rose to $20 per driveway, how many workers would you be willing to hire for a wage of $80 per day?
The logic is the same as part b, but now the price of shoveling is $20. The last column in the table shows marginal revenue product when price is $20. Now you are willing to hire 7 workers. Since the price of shoveling is higher, the output produced by each worker is worth more so each worker brings you more revenue and you are willing to hire more workers.
2. List the three things that will shift the demand curve for labor. Give an example related to shoveling driveways for each of the three things. The examples will vary. The three things that shift the demand curve for labor and an example of each are:

1. change in the price of output – if the price you can charge for shoveling a driveway goes up, the demand curve for labor shifts out (this is what we see in question 1 comparing parts b and c)
2. change in the productivity of workers – if workers went to a class to teach them techniques to be more effective at shoveling, their marginal physical product would go up and the demand curve for labor would shift out
3. change in the price or productivity of other inputs – if the price of high efficiency snow blowers goes down, you may get more snow blowers and hire fewer workers thus shifting in the demand curve for labor

3. Using the term we used in class to describe this, explain why it is that nurses that work 3rd shift (night shift) get paid more than nurses who work 1st shift (day shift).

This is called compensating wage differentials. It occurs when someone gets paid a higher wage (wage differential) to make up (compensate) for a job that has poor work conditions or is very risky. Since it is less pleasant to work nights, interrupting your sleep patterns, social life, etc., the only way hospitals can get people to work third shift is to compensate them by paying them a higher wage.

4. Explain what conditions have to hold in order for the “superstar phenomenon” to exist. Explain an example where these conditions do hold and we see superstars getting paid lots of money and give an example where these conditions do not hold and thus even the best people in that occupation don’t get paid lots of money. (Note: I want you to EXPLAIN why the example you give fits/doesn’t fit these conditions; don’t just write the name of the occupations.)

There are two conditions that have to hold. One is that everyone wants to buy from the best producer. The second is that technology must make it possible for the best producer to provide the good to all customers at a low cost. Examples will vary. An example of a job where this holds is a moviestar. Everyone wants to see a movie with the best actors and the way movies are produced makes it such that if you have a movie with a big star in it, customers around the country can see the movie with that star it in. An example of a job where this does not hold is a flight attendant. Even though everyone wants to have the best flight attendant, it is not possible for that one best flight attendant to simultaneously be on all the planes and thus serving customers around the country at the same time. Thus, we don’t expect to see any one flight attendant getting paid millions of dollars.

5. A friend of yours makes the following statement, “Since public education for elementary and secondary schooling is available to everyone, everyone has the same chance to succeed regardless of your race.” Based on what we learned about education, respond to this statement. We saw that many minority students go to schools that are still quite segregated. This can lead to differences in opportunities since there are large variations between states and within states in how much gets spent on education. Students in some school districts in Ohio get more than $17,000 spent per student per year while other students get around $5,000 spent. We also talked about the condition in some schools in Ohio, such as poor plumbing, not enough textbooks, and no foreign language classes.
6. Explain why the neoclassical theory of discrimination we discussed in class suggests that we should not see persistent discrimination. What assumption of the theory might be wrong given there is still evidence of discrimination?

   Over time, firms that discriminate will be driven out of business. Firms that discriminate will have to pay higher wages because they are not hiring the lower paid workers who are discriminated against; i.e. they are not hiring women when women get lower wages than men. This means they will have lower profit. In perfect competition, new firms enter driving down price and profits. Those firms that have higher wage costs won’t be able to survive and will go out of business. The assumption that might be wrong is the assumption of perfect competition. If there are barriers to entry, then firms that discriminate may be able to continue to stay in business (but they will still have lower profits than firms that do not discriminate).

7. What is the poverty line (not just what is the dollar amount, but where did it come from and what does it measure)? Describe at least three ways it may overstate the actual degree of poverty and three ways it may understate the actual degree of poverty in the U.S.

   The poverty line was developed in the 1960’s as a way to measure the minimum amount necessary for a family to survive at a basic standard of living. The government calculated how much it would take to feed a family and, since the average family spent 1/3 of its income on food, multiplied that amount by 3 to get the poverty line. The line is adjusted based on the number of people in the family and over time it is adjusted to reflect the changes in prices. However, this is a very arbitrary measure. The ways it may understate the extent of poverty is it ignores work expenses, child care expenses, the fact some areas (like New York City) have high cost of living, the fact food is now only 1/5 of the average family’s budget, and ignores health status/health care costs. The ways it may overstate poverty are it ignores in-kind transfers (like Medicaid, food stamps) that a family may receive, ignores assets a family may have, and doesn’t recognize that some areas have low cost of living.

8. Give a brief description of the poor in the United States. I am not looking for numbers, but for an idea of what is the age, race, etc. of the poor.

   Your answer should summarize the material presented in the PowerPoint lecture (the PowerPoint slides are available on my web page). Here is a summary. Children are much more likely to be poor than other age groups and almost half of all poor people are age 24 or younger. While African-Americans and Hispanics have a higher poverty rate than whites, most people who are poor in the United States are white. Family structure really affects poverty with single parents much more likely to be in poverty. Even though people who live in the city have higher poverty rates, there are about an equal number of poor people from rural areas, suburban areas, and cities. Also, most people in poverty are working or in a family with someone who is working.

9. Consider the government’s transfer programs. What kinds of transfer programs does the government spend most of its money on? What groups of people get the most benefit from the transfer programs?

   Social Security and Medicare (health care for the elderly) are the two largest government programs. Medicaid (health care for the poor) is the other large program. Cash transfers, food stamps, and housing assistance make up a small part of the government’s transfers. The government spends twice as much on Medicaid than on all cash programs for the poor combined. Given Social Security and Medicare are the largest program (and the elderly get the largest chunk of Medicaid), most of the benefit from transfer programs go to the elderly.

10. One way the government redistributes income is through the income tax system. Imagine you are able to design the tax system for the U.S. If your goal is to redistribute money (make
income after taxes more equal) would you use a tax like our personal income tax, payroll tax (social security tax) or sales tax? Explain.

You would use a tax like the personal income tax because personal income taxes make the income distribution after taxes more equal. This is because we have a progressive income tax system where higher income people pay a higher percent of their income in taxes (the marginal tax rate is higher the more income you have). Payroll tax does not affect the income distribution at all for most people since everyone pays the same percent of their income in payroll tax. The exception is high-income individuals (more than $90,000 in income). Since they do not have to pay payroll tax on income above $90,000 they actually pay a lower percent of their income in taxes and thus the tax is regressive. This results in the income distribution after taxes being less equal (those with income above $90,000 are able to keep more of their income and the income distribution is less equal). The sales tax would have no effect on the income distribution if everyone spent all their income since the sales tax charges everyone the same percent of what they spend. However, we know that higher-income people save more (spend a smaller percent of their income) and thus pay a lower percent of their income in sales tax. This makes sales taxes regressive and results in a less equal income distribution since higher-income individuals are paying less of their income in taxes.