Homework 3

ECON 380
UNC Chapel Hill

Name: _____

ONYEN: _____

> Due date: **October 9** by **2:25PM**. You must turn in your work on a printed copy of this document in order for it to be graded. Your assignment must be stapled and in the correct order. Non-stapled assignments or those not on a copy of this document will automatically receive a 10 point deduction.

Labor Market Equilibrium

1. Suppose demand for low-skilled workers in the United States is given by $E_D = 300 - 10w$ and supply of low skilled workers is given by $E_S = 30w - 300$, where E represents the number of workers (in millions) and w is the daily wage rate.

   (a) Solve for the equilibrium wage rate and employment level of low-skilled workers. **[2 pts]**

   (b) Plot the labor demand and labor supply functions on the graph below, labeling each as **[2 pts]** E_D and E_S, respectively.
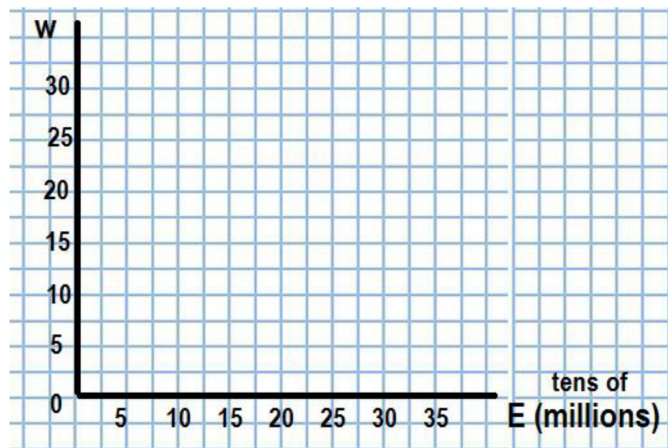
(c) On your plot above, label (i) worker surplus and (ii) firm surplus. Compute their values **[4 pts]** here.

(d) What is total surplus in the US market for low-skilled labor? **[2 pts]**

Now, suppose the government imposes a \$20 minimum wage in this market.

(e) Draw the effect of this minimum wage on the plot below, labeling the new (i) worker **[4 pts]** surplus, (ii) firm surplus, and (iii) any deadweight loss. Note: Assume that the workers with the lowest reservation wages are those that end up employed. This ensures we are calculating the maximum potential surplus as a result of this law.
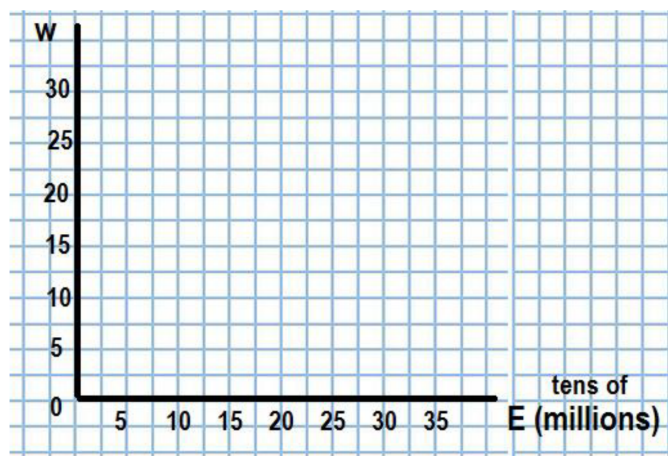
(f) How many workers will be employed as a result of this law? How many workers will be **[2 pts]** unemployed?

(g) What will be the <u>change</u> in (i) worker, (ii) firm, and (iii) total surplus as a result? **[3 pts]**

(h) Calculate the labor demand elasticity. **[2 pts]**

Immigration Impacts

2. Suppose that after an influx of immigrants, labor supply in the market for low-skilled workers is now given by $E_S = 30w - 180$. Labor demand is still $E_D = 300 - 10w$. The government decided against imposing a minimum wage and the market wage is freely determined by labor supply and demand.

   (a) Are the immigrants perfect substitutes or complements for native low-skill labor? **[2 pts]**

   (b) Plot the original market equilibrium along with the new labor supply curve on the plot below, labeling it E_S^1. **[2 pts]**
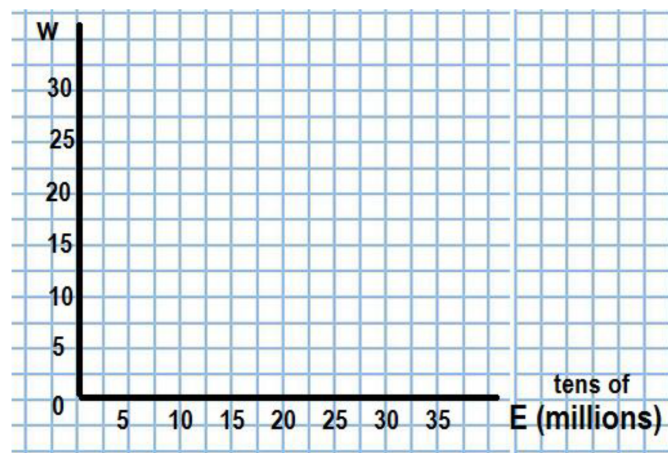
   (c) What is the equilibrium wage rate and employment level in the market for low-skilled labor after the influx of immigrants? **[2 pts]**

(d) How many native workers are employed now? **[2 pts]**

(e) Calculate the new native firm and native worker surplus. Label these on your plot. **[6 pts]**

(f) What is the <u>change</u> in total surplus as a result of this immigration wave? **[2 pts]**

Non-Competitive Labor Markets

3. Wrigley is a company town, and the only purchaser of labor in the region is the Wrigley Gum Company (WGC), who produce chewing gum to sell in the market for wholesale gum. WGC employs only labor, and labor is their only expenditure. Because they are a monopsony, they may either choose to pay low wages and hire just a few workers, or pay higher wages to induce more workers to produce gum. Note that the market for wholesale gum is competitive, so WGC must accept the market price of $35 for each box of gum they produce. Table 1 shows the number of labor hours WGC can hire at different wages and how much output is produced by those labor hours.

Table 1: WGC Costs and Production

Wage	Labor Hours	Total Cost	Marginal Cost	Output	Total Revenue	Marginal Revenue
$10	5		—	100		—
$12	6			101		
$14	7			102		
$16	8			103		
$18	9			104		
$20	10			105		
$22	11			106		
$24	12			107		
$26	13			108		

(a) Fill in the blank columns in Table 1. **[4 pts]**

(b) Assuming WGC is a profit maximizing firm, how many hours of labor should they hire? **[4 pts]**
Explain why.

(c) What is the profit earned by WGC if they employ the profit-maximizing number of labor **[2 pts]**
hours?

(d) Compare the wage rate to the value of the marginal product of labor. Which is greater (or **[2 pts]**
are they equivalent)?

(e) Now, suppose that the town of Wrigley imposes a minimum wage of $22. In Table 2 below, **[3 pts]**
fill in WGC's total cost, marginal cost, and profit. Assume prices and revenues are the
same as before.

Table 2: WGC Costs and Production

Wage	Labor Hours	Total Cost	Marginal Cost	Profit
$22	5		—	
$22	6			
$22	7			
$22	8			
$22	9			
$22	10			
$22	11			
$24	12			
$26	13			

(f) What happens to the quantity of labor employed after the minimum wage is imposed? **[2 pts]**
How does this compare to the effect of a binding minimum wage in a competitive market?

(g) What happens to worker surplus as a result of the minimum wage? Explain why. You **[2 pts]** don't have to calculate the change in worker surplus here, just explain why it changes in the direction it does.

(h) What happens to total surplus as a result of the minimum wage (relative to the total surplus **[2 pts]** without the minimum wage)? Explain why. You don't have to calculate the change in total surplus here, just explain why it changes in the direction it does.

LMDCs

Directions: Type your response to the following questions and attach them to the back of this packet. Non-typed answers will receive zero points.

4. Read the introduction to Fields (2011). In 5-7 sentences, summarize the evaluation framework **[4 pts]** outlined by the author to analyze proposed policy interventions.

5. Read the introduction of Jayachandran (2006). In 4-5 sentences, briefly summarize the paper's **[4 pts]** results in regards to how the wage responded differently to productivity shocks depending on the availability of "smoothing mechanisms."

6. Read the introduction to Jensen (2012). In 4-5 sentences, briefly summarize the paper's results **[4 pts]** in regards to how increased labor market opportunities affected young women's labor market participation as well as other outcomes beyond the labor market.

FOR GRADING:

Question:	1	2	3	4	5	6	Total
Points:	21	16	21	4	4	4	70
Score:							