FIRST TEST. ECON 335, FALL 2014. NAME: _____

Answer in the space provided. Show correct work for full credit. Box your final answers.

1. Labor supply, part 1: Supply function derivation. Let's analyze the labor supply decision of a worker named Ariel with Cobb-Douglas utility, i.e. utility with the form $U(e,c) = e^{\alpha}c^{\beta}$, where e is the share of time she spends not working (i.e. leisure), and c is her consumption (or total income). You can assume that $\alpha + \beta = 1$. Suppose also that Ariel faces a smooth, linear budget constraint with the form $c = (1-e)w + k$, where w is her wage rate and k is her non-labor income.

1a) On a graph that has e on the horizontal axis and c on the vertical axis (as in part g below), find the slope of Ariel's budget line.

1b) Write an expression for the slope of Ariel's indifference curve at any given e, c combination.

1c) Write an equation indicating that the slope of the budget line and the slope of the indifference curve are the same.

1e) Use the budget line and the equation from and (1c) to solve for Ariel's utility-maximizing combination of leisure and consumption, as functions of α, β, w, and k.

2. Labor supply, part 2: Income and substitution effects. We continue with Ariel from the previous problem, but now we specify that $\alpha = 1/2$ and $\beta = 1/2$, or in other words that her preferences can be represented by the utility function $U = e^{1/2}c^{1/2}$ (or $U = \sqrt{ec}$).

2a) Suppose that Ariel starts with a wage of $w = 16$ and a non-labor income of $k = 8$. Find her utility-maximizing choices of e and c.

2b) Find Ariel's utility maximizing choices of e and c if her wage increases to $w' = 24$ and her non-labor income remains at $k = 8$.

2c) If Ariel's wage is at the new, higher level of $w' = 24$, find k', the value of non-labor income that makes her original leisure-consumption combination from (2a) just barely attainable.

2d) If Ariel has the new, higher wage $w' = 24$, and non-labor income k' from (2c), what are her utility-maximizing values of e and c?

2e) Based on your answers to (2a), (2b), and (2d), find the numerical values of the substitution effect, income effect and total effect of Ariel's wage increasing from $w = 16$ to $w' = 24$, and enter them in the table below. (Be sure to include a minus sign if the effect is negative.)

	leisure	consumption
substitution effect		
income effect		
total effect		

2f) Now, let's forget about the specifics of this problem (e.g. Cobb-Douglas utility function, etc.), and speak more generally about the ways that an increase in a person's wage can change their labor supply decision. Clearly explain (as if to a non-economist) the income effect, substitution effect, and total effect of a wage increase on a person's utility-maximizing amounts of leisure and consumption. That is, what sign does each effect have (if it can be determined), and most crucially, why?

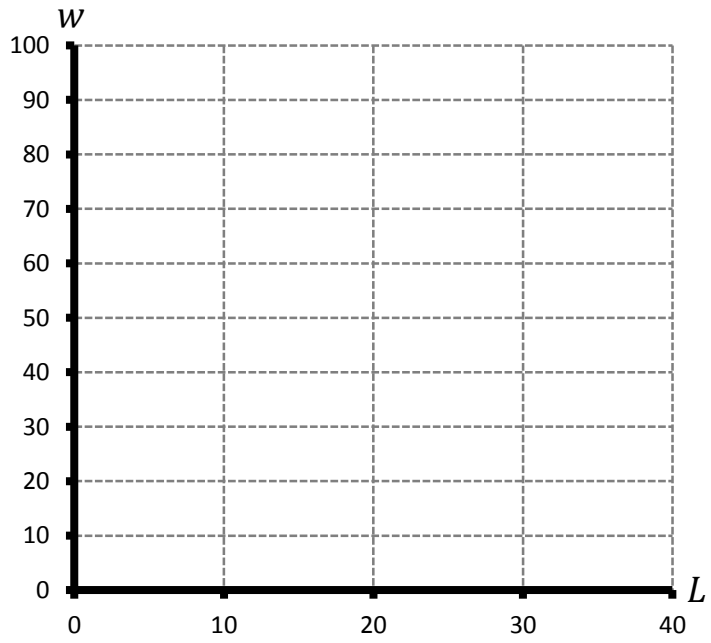
3. Labor demand and monopsony. I own a goo factory, which has the production function $Q(L) = 20L - \frac{1}{10}L^2$, where Q is the quantity of goo I can produce and L is the quantity of labor I employ. The market for goo is perfectly competitive, with a going price of 5 dollars per unit. But the market for goo factory workers in my town is not perfectly competitive; I face an upward-sloping labor supply curve that can be represented by the marginal cost of labor function $MC_L(L) = 40 + L$.

3a) Find $MRP_L(L)$, my marginal revenue product of labor function.

3b) Assuming that I'm out to maximize my profit, find the quantity of labor I should employ (L) and the wage that I should offer (w).

3c) Continuing from part b, find my firm surplus (FS), the workers' surplus (WS), and the deadweight loss (DWL) associated with my labor market being monopsonistic rather than competitive.

3d) On the graph below, draw MRP_L, MC_L, and ME_L (the marginal expense of labor function I face). Use different colors or shading to indicate FS, WS, and DWL.



4. Long-run labor demand. Explain the substitution effect and scale effect of an increase in the wage on a competitive firm's demand for labor and for capital. In this context, explain what it means for labor and capital to be 'gross substitutes' or 'gross complements', in terms of which of these two effects is dominant.

5. Minimum wages and labor demand elasticity. Define the own-wage elasticity of demand for labor. Explain how the value of this elasticity bears on the question of whether minimum wage increases will improve the aggregate well-being of workers. Use diagrams to illustrate a low-elasticity case and a high-elasticity case.

6. Minimum wages, efficiency and equity. Suppose a simple, perfectly competitive labor market with a downward-sloping demand curve and an upward-sloping supply curve. Suppose further that a binding minimum wage is imposed. Explain very clearly why this minimum wage might decrease efficiency, and why it might increase equity. Carefully define the terms you use, such as efficiency, equity, surplus, deadweight loss, etc. Try to make your answer intelligible to a non-economist. Draw a diagram to aid your discussion of efficiency.