Due by Tuesday, September 18

1) What does the marginal rate of substitution (MRS) imply regarding the consumption of goods \( C \) and leisure \( L \) under the assumption of convex indifference curves.

2) Tom earns $15 per hour for the first 40 hours of work each week. He is paid $30 per hour for every hour worked in excess of 40. Tom faces a 20 percent tax rate and pays $4 per hour in child care expenses for each hour he works. Tom receives $80 in child support payments each week. There are 168 hours in the week. Graph Tom’s weekly budget line.

3) Shelly’s preferences for consumption and leisure can be expressed as \( U(C, L) = (C - 20)(L - 80) \). This utility function implies that Shelly’s marginal utility of leisure is \( C - 20 \) and her marginal utility of consumption is \( L - 80 \). There are 168 hours in the week available to split between work and leisure. Shelly earns $5 per hour after taxes. She also receives $320 worth of welfare benefits each week regardless of how much she works.
   a) Graph Shelly’s budget line.
   b) What is Shelly’s MRS when \( L = 100 \) and she is on her budget line.
   c) Find Shelly’s optimal amount of consumption and leisure.
   d) What is Shelly’s reservation wage?

4) Cindy gains utility from consumption \( C \) and leisure \( L \). The most leisure she can consume in any given week is 168 hours. Her utility function is \( U(C, L) = C * L \). This functional form implies that Cindy’s marginal rate of substitution is \( C/L \). Cindy receives $630 each week from her grandmother (regardless of how much Cindy works). What is Cindy’s reservation wage?

5) You can either take a bus or drive your car to work. A bus pass costs $5 per week, whereas driving your car to work costs $60 weekly (parking, tolls, gas, etc.). You spend half-an-hour less on a one-way trip in your car than on a bus. How would you prefer to travel to work if your wage rate is $10 per hour? Will
you change your preferred mode of transportation if your wage rate rises to $20 per hour? Assume you work five days a week and time spent riding on a bus or driving a car does not directly enter your utility.

6) What happens to the hours of work decision when there is an increase in the wage rate? Explain your answer in details using a graph (assume the case where substitution effect dominates the income effect).

7) Among single, college educated men aged 22-25 years old, average annual hours worked is 2,160 and the average wage is $22.50. If the average wage increases to $25 per hour, average annual hours worked increase to 2,340. What is the elasticity of labor supply for this group of workers?

8) Derive the labor supply curve of the representative worker/individual using a graph.