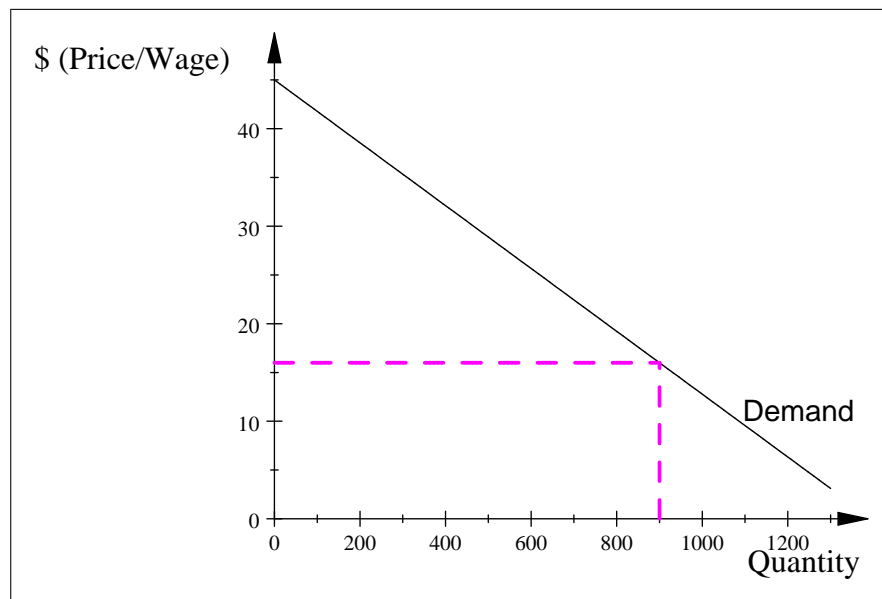# PPOL 8640 Assignment 1

Due: September 13, 2022 at beginning of class

1. (20 points) Consider the market for CMS school bus drivers. The current price (wage) offered by CMS is $16. The figure shows the demand curve for school bus drivers. The dashed lines show the quantity demanded (900) at the current price ($16).


a Currently the market is in disequilibrium as there is a shortage (less quantity supplied than quantity demanded at the offered wage) of 200 school bus drivers. Draw a supply curve that illustrates this shortage. Be precise.

b Using the supply curve you have drawn, identify on the graph and (approximately) numerically the equilibrium price and quantity. Would the $16 wage offer need to be raised or lowered to reach the equilibrium you have identified?

c Assume that CMS needs 900 school bus drivers but is unable to change the wage being offered (assume the slope of the demand curve cannot be changed nor can the demand curve be shifted). What changes to the potential employee's compensation package might CMS make in order to shift the supply curve? Explain how these changes shift supply.

2. (35 points) Currently there is discussion about a policy to forgive $10,000 of student loan debt. Assume that the debt will still be paid but the federal government is now paying the portion of the debt forgiven instead of the individual borrowers.[1]

   a If future borrowers believe that the federal government will implement similar forgiveness policies in the future, explain how those beliefs would affect the demand for student loans.

   b If future lenders believe that the federal government will implement similar forgiveness policies in the future and is less likely to default on loans than any individual borrower, explain how those beliefs would affect the supply of student loans.

   c Using your responses to parts **a** and **b**, would we expect to see an increase or decrease in the quantity of student loans? Explain.

   d Suppose there are two individuals, one with $8,000 of student loan debt (low balance person) and one with $75,000 of student loan debt (high balance person). Both individuals currently pay $750 each month as their student loan payment and both qualify for the loan forgiveness program. Assume that the loan forgiveness is like an early payment to the principal balance of the loan and that the early payment does not affect the monthly payment unless the remaining principal plus interest is less than the regular monthly payment. An argument in favor of the policy is that the forgiveness program will allow individuals to save money towards larger purchases, such as homes. Using these two individuals as representative of two extreme scenarios, with other individuals somewhere between those two extremes, explain whether or not the loan forgiveness is likely to have an immediate impact on savings towards larger purchases. If the immediacy differs among individuals, explain.

   e Currently there is a Public Service Loan Forgiveness program which allows for loan forgiveness for individuals employed by U.S., federal, state, local, or tribal government or not-for-profit organizations (public service jobs) if certain conditions are met. These jobs tend to be lower paying than similar private sector jobs, so loan forgiveness is one method of attracting employees. Explain how the broader forgiveness policy could affect the demand for public service jobs.

---

[1]I know the policy being discussed has more detail than the one in the question, but we start with a simple model.

3. (45 points) Consider a consumer with a utility function $u(x_1, x_2) = x_1^{2/3} x_2^{1/3}$, where x_1 is the quantity of Good 1 consumed and x_2 is the quantity of Good 2 consumed. Three indifference curves for this consumer are plotted below. The price of Good 2 is $5.
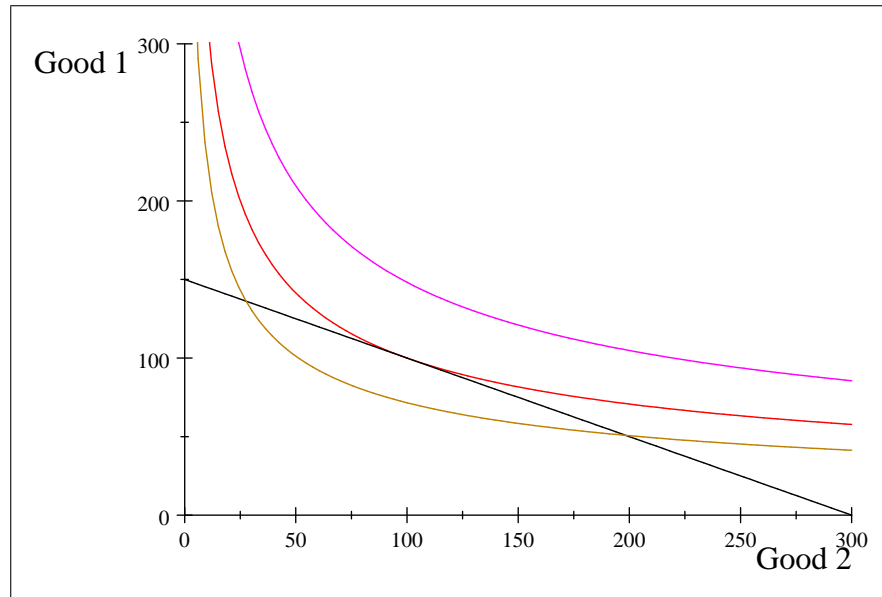
a Pick an indifference curve and label the following bundles. You do not have to use the same indifference curve for each question:

  i Label a bundle that is unaffordable as A.

  ii Label a bundle that is affordable but not one on which the consumer spends all income as B.

  iii Label a bundle on which the consumer spends all income but is not utility maximizing as C.

  iv Label the bundle that is utility maximizing as D.

b How much income does this consumer have? Explain.

c What is the price of Good 1? Explain. Note that the budget constraint intersects the Good 1 axis at 150.

d Set up, but do not solve, the Lagrangian for this consumer using the numerical values you found for income and prices.

e The marginal utility of Good 1 at the optimal bundle is $\frac{2}{3}$. What is the marginal utility of Good 2 at the optimal bundle? Explain. Note: You can solve the entire optimization problem if you like but there is an easier way.

f Assume the price of both goods double but income also doubles. Does the choice of optimal bundle change? Explain by comparing the original budget constraint to the new budget constraint.