14.02 Principles of Macroeconomics
Problem Set # 1, Questions

Posted on Thursday, September 12, 2002, due on Thursday, September 19, 2002. If you staple a copy of this front page on your problem set you will get 3 points for free. Remember to write down your TAs section name and recitation time. Also your name and MIT ID.

Name: _____

MIT ID: _____

TA: _____

(Table is for corrector use only)

	1	2	3	4	5	6	7	8	Total
Part I									
Part II									
Part III									
Part IV									
Grand Total									

Part I: True/ False Questions: Decide whether each statement is true or false and justify your answer with a short argument. (5 points each, 35 points total)

1. Tightening law enforcement against illegal workers in the US can increase real wages.

2. Contrary to what is often stated by politicians, a reduction in the budget does not necessarily lead to an increase in investment

3. The company's total annual sales of $200 to the households were generated through only the cost of $50 wages and $60 raw material. This means that this company's contribution to the GNP was $140 in added value, $200 in final goods or $140 in household income.

4. "Exogenous" variables of a macroeconomic model would include policy variables such as government defense purchases.

5. If a new federal budget raises government purchases by $100 per person and pays for this with a new per capita tax also equal to $100 per person so that the government deficit is unchanged, and the central bank holds interest rates unchanged, then GDP will also be unchanged.

6. The real output per capita is one of the best measures of the standard of living.

7. Exports can be larger than GDP

Part II: National Income Accounting Definitions (2 points each, 10 Points)

Fill in the missing word or words to complete the definitions below:

1. The difference between gross (GNP) and net (NNP) national product is _____.

2. NNP minus "National income" equals _____.

3. Personal income minus _____ equals disposable income.

4. Consumers allocate their disposable income between consumer spending and _____.

5. Give one example of a type of government spending not counted as "G" in the standard GDP identity: _____.

Part III. National Accounts (4 points each, 32 points total)

There are an orange farm and an orange juice company in a country called Orangeland. Orangelanders live only on orange juice. In 1992, the orange farm produced 10 oranges, and sold them to the orange juice company at $1 each. The orange juice company produced 3 bottles of orange juice, and sold them all at a unit price of $10 plus 10% indirect tax collected by government (so the price paid was actually $11). The orange farm paid total wages of $6. The orange juice company paid total wages of $10. The orange juice company also had to pay $4 to replace the orange juice extractor that was not working properly due to its use during 1992 (depreciation). Both companies retained 50% of their profits and paid the rest of it as dividends to the households. After receiving their wage income and their dividends, the households paid a 10% direct tax on their total income to the government. The government bought one orange juice bottle. (Notice that the firms are not paying any direct taxes on their retained profits)

1. Compute the GNP of Orangeland using the value added approach or the final goods approach.

2. What is NNP? What is National Income?

3. What is the total income of the government?

4. What is government budget deficit (or surplus)?

5. What is the disposable income (income available for consumption) of the households?

In 1993, the price of all the goods (oranges and orange juice bottles) went up by 10%.

6. Would you say that the economy experience a real economic expansion between 1992 and 1993? Explain.

7. What was the nominal GNP in 1993? What is the inflation rate?

8. What was the real GNP in 1993 measured at 1992 prices?

Part IV. Fiscal Policy (4 points each, 20 points total)

Consider the following model of the economy:

$C = 50 + 0.6(Y-T)$
$I = 10 + 0.1Y - i$
$G = 100$
$X = M = 0$

> where C is consumption, Y is income, T is taxes, I is investment, i is the interest rate (measured in percentage points, i.e. an interest rate of five percent is i=5 instead of i=0.05), G is government spending, X is exports and M is imports.

1. State the equilibrium condition for GNP (national income) and give a brief explanation of what it means. Solve for national income as a function of the unknown variables, i and T.

2. Now assume that the government budget is balanced, and write income as a function of the interest rate. Plot this curve in i-Y space. State and interpret the slope of this curve.

3. Assume that i= 10. What is the value of autonomous spending? What is the value of the multiplier? Interpret the multiplier.

4. The government decides to increase spending by 10. If it doesn't raise taxes, what will the new values of autonomous spending, the multiplier, and equilibrium income be? Give a brief explanation of why income changed by as much or as little as it did. If the government raises taxes at the same time to maintain a balanced budget, what will the new values of autonomous spending, the multiplier, and equilibrium income be? Give a brief explanation of why income changed by as much or as little as it did.

5. Now, instead of assuming that the government collects a fixed amount of taxes, assume that it collects a fixed percentage of national income: T=tY. Assuming the tax rate, t, is one-third, solve for equilibrium income, autonomous spending, and the multiplier. Explain any differences with your answers to part 2. Is the government budget balanced? What happens now if the government increases spending by 10? State and briefly explain the changes in equilibrium income and the government budget deficit.