The Digital Economist

Intermediate Macroeconomics
Worksheet #1: **Macroeconomic Data** Name:_____

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1. Given the following data for a three good economy:

	Base Year		**1998**		**1999**		**2000**	
Good	**P**	**Q**	**P**	**Q**	**P**	**Q**	**P**	**Q**
Apples	1.50	100	1.60	120	1.60	150	1.75	150
Bread	1.00	200	1.25	225	1.25	230	1.30	230
Milk	1.25	150	1.40	140	1.40	180	1.50	180

a. Calculate the following:

	Nominal GDP (**NGDP**)	Real GDP (**RGDP**)
1998	_____	_____
1999	_____	_____
2000	_____	_____

b. Calculate the rate of Economic Growth between:

1998 & 1999: _____ *and* 1999 & 2000: _____

c. Calculate (to three decimal places) the value of the **GDP Deflator** and the **Consumer Price Index** (CPI) for the following years:

	GDP Deflator	**CPI**
Base Year:	_____	_____
1998:	_____	_____
1999:	_____	_____
2000:	_____	_____

d. Why do these price indexes differ?

e. Calculate the annual rate of inflation between:

1998 & 1999: _____ *and* 1999 & 2000:_____

2. Values for Real GDP and the Consumer Price Index (CPI) are as follows:

	RGDP	CPI
a.	$8,675	166.6
b.	$8,910	175.2

Calculate the rate of inflation between 1999 & 2000, derive the real rate of interest (return) for the year 2000 if nominal interest rates are 7%:

Is this real rate of interest above or below the rate of economic growth for the same period of time?_____ Is this to the benefit of lenders or borrowers?_____ Explain.

3. In any debt contract, both borrower and lender come to an agreement with respect to the nominal rate of interest based in part on inflationary expectations. Lenders include this inflation premium to protect the purchasing power of the funds being lent. Borrowers agree to this rate on interest because they expect that future inflation will enhance their ability of repay the debt. The ability to pay the debt is known as the (interest) burden of the debt and may be calculated as follows:

$$\text{Burden} = \frac{\text{Interest Expense}}{\text{Income}}$$

Assume that an individual borrows $100,000 to purchase a house at 7% interest. Embedded in this interest rate is an inflation premium (π^e) of 5%. Both borrower and lender agree to this inflation premium.

a. Given this information, what is the real rate of return of the loan to lenders?_____

b. If the borrower has an annual income of $28,000, what is the debt burden of this loan?_____

c. If the actual rate of inflation (p) is 5% over the first three years of the loan, calculate the level of income (growing at this same rate) and the (interest) burden of the debt:

	Income (at 5% growth)	Burden	Income' (at 3% growth)	Burden'
Year 1:	_____	_____	_____	_____
Year 2:	_____	_____	_____	_____
Year 3:	_____	_____	_____	_____

What is happening to the burden of the debt over time?_____

d. Now perform the same calculations for an annual rate of inflation of 3%. Do borrowers benefit or are they hurt by this lower rate of inflation? _____ Explain.