

1) Macroeconomic information for the economy of Anchovy is given below.

	Year 1	Year 2
Output (pizzas)	8000	9000
Employment (workers)	700	800
Unemployed (workers)	70	100
Labor force (workers)	770	900
Price per pizza	\$8.00	\$9

- (a) What was the growth rate of average labor productivity in Anchovy between Year 1 and Year 2?
 - (b) What was the inflation rate in Anchovy between Year 1 and Year 2?
 - (c) What was the unemployment rate in Year 1? In Year 2?
- 2) Using the CPI measure of the price level, which is 100 in the base year of 2007, calculate the annual inflation rates for
- (a) 2008, when the index is 103.7.
 - (b) 2009, when the index is 105.5.
 - (c) 2010, when the index is 107.7.
- 3) Compare and contrast the classical and Keynesian schools of thought for the following economic issues.
- (a) The flexibility of wages and prices.
 - (b) The importance of macroeconomic policies.
- 4) In a given year, a country's GDP = \$3843, net factor payments from abroad = \$191, taxes = \$893, transfers received from the government = \$422, interest payments on the government's debt = \$366, consumption = \$3661, and government purchases = \$338. Calculate the values of private saving, government saving, and national saving.
- 5) Nominal GDP in a country was \$8759.9 billion in 2014 and \$9254.6 billion in 2015. The GDP deflator was 102.86 for 2014 and 104.37 for 2015.
- (a) What is the growth rate of nominal GDP between 2014 and 2015?
 - (b) What is the inflation rate from 2014 to 2015?
 - (c) What is the growth rate of real GDP from 2014 to 2015?
- 6) Loretta agrees to lend Ted \$500,000 to buy computers for his consulting firm. They agree to a nominal interest rate of 8%. Both expect the inflation rate to be 2%.
- (a) Calculate the expected real interest rate.
 - (b) If inflation turns out to be 3% over the life of the loan, what is the real interest rate? Who gains from unexpectedly high inflation, Loretta or Ted?
 - (c) If inflation turns out to be 1% over the life of the loan, what is the real interest rate? Who gains from unexpectedly low inflation, Loretta or Ted?

- 7) In the U.S. economy in 1991, real GDP was 4861.4 (in billions of 1987 dollars), the capital stock was 13,806.2 (in billions of 1987 dollars), and employment was 118.4 (in millions of workers). In 1992 the numbers were: real GDP 4986.3, capital stock 14,040.8, employment 119.2. Suppose the production function in both years is $Y = AK^{0.25}N^{0.75}$.
- Calculate total factor productivity for 1991 and 1992.
 - How much did total factor productivity grow from 1991 to 1992?
 - Calculate the percent increase in real output between 1991 and 1992.
 - Suppose tax incentives had raised the capital stock in 1992, making it 10% higher, to 15,444.9. If employment didn't change, what would have been the percent increase in real output between 1991 and 1992?
 - Instead of the increase in the capital stock in part d, suppose employment was 10% higher in 1992, making it 131.1. With the capital stock fixed at 14,040.8, what would have been the increase in real output between 1991 and 1992?
- 8) Suppose the economy's production function is $Y = AK^{0.3}N^{0.7}$. Suppose $K = 200$, $N = 2000$, and $A = 1$. Calculate the marginal products of labor and capital.
- 9) Suppose a firm's hourly marginal product of labor is given by $MPN = A(200 - N)$.
- If $A = 0.2$ and the real wage rate is \$10 per hour, how much labor will the firm want to hire?
 - Suppose the real wage rate rises to \$20 per hour. How much labor will the firm want to hire?
 - With the real wage rate at \$10 per hour, how much labor will the firm want to hire if A rises to 0.5?
- 10) In April 2000, the United States had a labor force of 141,230,000, employment of 135,706,000, and there were 67,986,000 people not in the labor force (all numbers rounded to the nearest 1000).
- Calculate the unemployment rate.
 - Calculate the participation rate.
 - Calculate the employment ratio.

Answer Key

Testname: CHAPTERS1,2,3PROBLEMSETWITHSOLUTIONS

- 1) (a) Average labor productivity: Year 1: $8000/700 = 80/7$; Year 2: $9000/800 = 90/8$; growth rate = $[(90/8)/(80/7)] - 1 = -0.016 = -0.16\%$
(b) Inflation rate: $(9/8) - 1 = 0.125 = 12.5\%$
(c) Unemployment rates: Year 1: $70/770 = 0.091 = 9.1\%$; Year 2: $100/900 = 0.111 = 11.1\%$
- 2) (a) Inflation in 2008 = $(103.7 - 100)/100 \times 100\% = 3.7\%$.
(b) Inflation in 2009 = $(105.5 - 103.7)/100 \times 100\% = 1.7\%$.
(c) Inflation in 2010 = $(107.7 - 105.5)/100 \times 100\% = 2.1\%$.
- 3) (a) The flexibility of wages and prices is a principal point of disagreement between classical economists and Keynesians. Classical economists believe that wages and prices are quite flexible; in response to a change in market conditions, wages and prices adjust quickly to their new market-clearing levels. Keynesians believe that wages and prices are rigid or sticky; in response to changes in the economy, wages and prices adjust slowly to their new market-clearing levels.
(b) Classicals and Keynesians also disagree about the use of macroeconomic policies. Given wage-price flexibility, classical economists believe that the market economy normally provides for full employment. They believe that government intervention in the form of macroeconomic fiscal and monetary policies is not needed to prevent recessions. Given slow adjustments in wages and prices, Keynesians believe that recessions could plague the economy for several years. They believe that efficient use of macroeconomic policies could return the economy to equilibrium more quickly.
- 4) Private saving = $Y + NFP - T + TR + INT - C = \$3843 + \$191 - \$893 + \$422 + \$366 - \$3661 = \268 . Government saving = $T - TR - INT - G = \$893 - \$422 - \$366 - \$338 = -\$233$. National saving = $Y + NFP - C - G = \$3843 + \$191 - \$3661 - \$338 = \$35$.
- 5) (a) $9254.6/8759.9 \times 100\% = 5.6\%$.
(b) $[(104.37/102.86) - 1] \times 100\% = 1.5\%$.
(c) Real GDP (2014) = $8759.9/1.0286 = 8516.3$.
Real GDP (2015) = $9254.6/1.0437 = 8867.1$.
Growth rate = $[(8867.1/8516.3) - 1] \times 100\% = 4.1\%$.
Note that the growth rate of nominal GDP (5.6%) equals the inflation rate (1.5%) plus the growth rate of real GDP (4.1%).
- 6) (a) $8\% - 2\% = 6\%$.
(b) $8\% - 3\% = 5\%$. Ted gains from unexpectedly high inflation, because he repays the loan with dollars that aren't worth as much as was expected.
(c) $8\% - 1\% = 7\%$. Loretta gains from unexpectedly low inflation, because she gets repaid with dollars that are worth more than was expected.
- 7) (a) 1991: 12.49; 1992: 12.70
(b) +1.7%
(c) +2.6%
(d) $Y = 5107.5$, a 5.1% increase
(e) $Y = 5356.2$, a 10.2% increase
- 8) Using calculus, the marginal product of capital is $dY/dK = 0.3A(N/K)^{0.7}$ and $dY/dN = 0.7A(K/N)^{0.3}$.
Plugging in the values for N and K gives: $MPK = 0.3(2000/200)^{0.7} = 1.5$; $MPN = 0.7(200/2000)^{0.3} = 0.35$. If you do not use calculus, you can arrive at the same answer (rounded) by plugging the values of for A , N and K into the production function to find $Y = 1002.37$. Increase K by 1 and recalculate Y ; it is now 1003.88. The difference is the $MPK = 1003.88 - 1002.37 = 1.51$. Increase N by 1 and recalculate Y ; it is 1002.73. The difference is the $MPN = 1002.73 - 1002.37 = 0.36$.
- 9) (a) The firm will hire labor such that $w = MPN$, or $10 = 0.2(200 - N)$, so $N = 150$.
(b) Now $20 = 0.2(200 - N)$, so $N = 100$. The firm's labor demand falls when the wage rate rises.
(c) Now $10 = 0.5(200 - N)$, so $N = 180$. The increase in productivity increases labor demand.

Answer Key

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- 10) (a) Unemployment = labor force - employment = $141,230,000 - 135,706,000 = 5,524,000$, so the unemployment rate is $5,524,000/141,230,000 = 3.9\%$.
- (b) The participation rate is the fraction of the adult population in the labor force. The adult population is the labor force + the number not in the labor force = $141,230,000 + 67,986,000 = 209,216,000$. The participation rate is then $141,230,000/209,216,000 = 67.5\%$.
- (c) The employment ratio is the employed fraction of the adult population, which is $135,706,000/209,216,000 = 64.9\%$.