

PROBLEM SET #1

2 % of grade; 12 points possible; max you can earn=10 points

DUE: via gradescope, 10:00.00 a.m. on Friday February 1

See email from Prof. Olney & links on Econ 100B website re submitting PS on gradescope

Problem sets must be uploaded and submitted by 10 am. No problem sets accepted after gradescope window closes. Your submitted work must be your own: Problem sets that are identical (in whole or in part) to another student's problem set will receive a zero.

Follow these guidelines. Except where indicated, your answers must be on the answer sheet. Write your GSI's name and your name on the first answer sheet. You can hand write or type your answers for 1-3; type your answers for 4. When you are done, you will scan the answer sheets (see gradescope hints on course website) and convert to a pdf file. No need to scan this sheet of questions. You will then tell gradescope on which page we will find your answers. Gradescope is accessible via our bcourses site.

1. (3 points; 1/4 point each) Based on what you learned in your principles course, and in your own words, write a 1-sentence definition of each of the following terms. It's important that this is your own words, not copied or paraphrased from a source. If you can't define these terms in your own words, reconsider whether this course is for you.

- gross domestic product
- unemployment rate
- labor
- inflation rate
- economic growth
- aggregate demand
- money
- capital
- fiscal policy
- monetary policy
- government deficit
- government debt

2. (3 points total; 1 point each)

Before working this problem, read the box on page 99 of the textbook.

The rate of growth over time of some variable X , $\% \Delta X$, is just $(\text{new } X - \text{old } X) / (\text{old } X) = \Delta X / X$.

Calculus! The rate of growth over time of X is also equal to the derivative of $\ln(X)$ with regard to time.

Let t stand for time.

Remember the chain rule.

Remember the derivative of $\ln(X) = 1/X$.

And remember: a derivative is just change, so dX/dt is the change in X over the change in t .

And thus we have,
$$\frac{d(\ln X)}{dt} = \frac{d(\ln X)}{dX} \cdot \frac{dX}{dt} = \frac{1}{X} \cdot \frac{dX}{dt} = \frac{\left(\frac{dX}{dt}\right)}{X} = \frac{\Delta X \text{ over time}}{X} = \text{growth rate of } X$$

- Use the rules of natural logs and calculus to show that the rate of growth over time of a product of two variables, xy , is the sum of the rates of growth of the variables x and y .
- Use the rules of natural logs and calculus to show that the rate of growth over time of a quotient of two variables, x/y , is the difference between the rates of growth of the variables x and y .
- Use the rules of natural logs and calculus to show that the rate of growth over time of a variable x raised to a constant power b , x^b , is the constant b times the rate of growth of the variable x .

3. (2 points total; ½ point each)

For each activity listed below, indicate where the activity would be recorded on the **expenditure** side of U.S. GDP accounting. Your choices are C, I, G, GX (exports), IM (Imports), and NR (not recorded). Give a brief explanation for each answer; one sentence should suffice.

- a. The federal government pays salaries to federal workers and makes payments to independent contractors who have contracts with the federal government.
- b. A California resident spends \$50 in their favorite Thai restaurant in Berkeley.
- c. A Berkeley restaurant buys a new dishwashing machine that was manufactured in Mexico.
- d. A California resident travels to Thailand and spends \$50 on a restaurant meal in Bangkok.

4. (4 points total; 1 point each)

Consider this argument

An increase in K or an increase in L will generate economic growth.

- a. Construct a truth table for this argument.
- b. If neither K nor L are increasing, is the argument false? Explain.
- c. Using the 5-step Olney method, identify an assumption that is critical to the argument (step 3). Explain why the assumption is critical (step 4).
- d. Connect your critique in part c to your truth table in part a. Be sure to point out which row of your truth table is relevant to your critique.

GSI's Name _____

Your Name _____

Economics 100B (Prof. Olney)

Spring 2019

Answer Sheet for Problem Set #1

gross domestic product

unemployment rate

labor

inflation rate

economic growth

aggregate demand

money

capital

fiscal policy

monetary policy

government deficit

government debt

2a.

2b.

2c.

3a.

3b.

3c.

3d.

#4 should be typed up on a separate sheet of paper. Be sure each part of #4 is labeled clearly (a, b, c, d).