

Do NOT write your name anywhere. (Canvas will tell me who turned in the assignment.) All answers must be typed, except for mathematics and graphs. Take pictures of your written answers and use your own software or <https://pdfcandy.com/> to create a single PDF size A4. (pdfcandy.com will convert many file types to PDF, resize PDF, merge PDF and many other things for free. However, Apple phones may require using [CamScanner](#) before using pdfcandy.com.) Failure to follow these directions will cost you 10 points.

1) (10 points) On Antiques Road Show, it is not uncommon to hear a statement like, “My father spent \$10 on it 70 years ago and it is now worth \$500. That is quite a large return!” Calculate the actual average annual return and then tell me if you think it is a large return. Show all work and briefly explain your logic.

2) (10 points) Suppose an economy grew at a 11% rate, the capital grew at a 12% rate, and the labor grew at a 8% rate. What was the rate of total factor productivity? Show all calculations.

3) (10 points) In *Intermediate Macroeconomics*, ECON 302, the authors add another line to the Solow Growth Model which your book does not include. In that book, they use the diagram to formally prove that a faster growth rate of the population will lead to a lower GDP per capita. For this class, I do not care about the formal proof. What do you think is the economic logic as to why this is true? Explain your logic. (Hint: It may help you to figure out what happens on the production function graph when L increases.)

4) (10 points) Your book says that investment is financed by saving. Why is this true? Why is that hard for a developing country to do that?

5) (20 points) Draw the per capita production function. Illustrate the effects of an improvement in technology. Explain why it moved as drawn.

6) (20 points each) For the following characteristics of rapidly growing economy, explain how that increases the growth rate of the economy and what the government can do to achieve it.

A) Favorable environment for private enterprise.

B) An economy open to free trade.