

Problem Set # 4

Econ 1015

- 1) Richland's real GDP per person is \$10,000 and Poorland's real GDP per person is \$5,000. However, Richland's real GDP per person is growing at 1 percent per year and Poorland's is growing at 3 percent per year. Compare real GDP per person in the two countries after 10 years and after 20 years. Approximately how many years will it take Poorland to catch up to Richland?
- 2) Consider two economies: Jayhawkville and Tigerland. In 2005, real GDP in Jayhawkville was \$50 million and population was 100,000 people, while real GDP in Tigerland was \$100 million and there were 200,000 people. Suppose that population stayed constant in both economies and that real GDP grew 2 percent a year. What would be the difference in real per capita GDP between the two economies in 2010?
- 3) In Missouri there are 6 million people. Average labor productivity is \$50,000 per worker. Missouri's real GSP (Gross State Product) per person is \$30,000. Use this information to compute real GDP and the number of people employed.
- 4) Harrison, Carla, and Fred are housepainters. Harrison and Carla can paint 100 square feet per hour using a standard paint brush, and Fred can paint 80 square feet per hour. Any of the three can 200 square feet per hour using a roller.
 - a) Assume that Harrison, Carla, and Fred have only paintbrushes at their disposal. What is the average labor productivity, in terms of square feet per painter-hour, for the three painters taken as a team? Assume that three painters always work the same number of hours.
 - b) Repeat part a) for the case in which the team has one, two, three, or four rollers available. Are there diminishing returns to capital?
 - c) An improvement in paint quality increases the area that can be covered per hour by either brushes or rollers. The increase is 20 percent. How does this technological improvement affect your answers to part b). Are there diminishing returns to capital? Does the technological improvement increase or decrease the economic value of an additional roller?
- 5) The Penn World Table is located at the following site:
http://pwt.econ.upenn.edu/php_site/pwt62/pwt62_form.php

It is pretty straightforward to obtain data from the menu. Find real GDP per capita for Argentina, United Kingdom, and Taiwan for 2003 and 2004. Compute the growth rate in real GDP per capita for all three countries.