14.06 Macroeconomics
Spring 2003

Problem Set 1
(due on the day of Lecture # 1)

Problem
Kaldor (1961) described a number of stylized facts about economic growth:

1. Per capita output grows over time, and its growth rate does not tend to diminish.
2. Physical capital per worker grows over time.
3. The rate of return to capital is nearly constant.
4. The ratio of physical capital to output is nearly constant.
5. The shares of labor and physical capital in national income are nearly constant.
6. The growth rate of output per worker differs substantially across countries.

Consider the Solow growth model discussed in class and described in Chapter 1 of Romer. Assume that both labor and capital are paid their marginal products. Let w denote $\frac{\partial F(K,AL)}{\partial L}$ and r denote $\frac{\partial F(K,AL)}{\partial K}$.
Show that the balanced growth path of this model fits the stylized facts 1.-5. stated above, that is prove that along the balanced growth path:

1. Per capita output $\frac{Y}{L}$ grows at a positive and constant rate.
2. Capital per worker $\frac{K}{L}$ grows at a positive and constant rate.
3. The rate of return to capital r is constant.
4. The ration of physical capital to output $\frac{K}{Y}$ is constant.
5. The share of labor and physical in national income $\frac{wL}{Y}$ and $\frac{rK}{Y}$ are constant.

Kaldor, Nicholas. 1961. "Capital Accumulation and Economic Growth." In F.A. Lutz and D.C. Hague, eds., *The Theory of Capital*, 177-222. New York: St. Martin's Press.