1. Country A and country B both have the production function \( Y = F(K, L) = K^{1/2}L^{1/2} \).
   a. Does this production function have constant returns to scale? Explain.
   b. What is the per-worker production function, \( y = f(k) \)?
   c. Assume that neither country experiences population growth nor technological progress and that 5 percent of capital depreciates each year. Assume further that country A saves 10 percent of output each year and country B saves 20 percent of output each year. Using your answer from part (b) and the steady-state condition that investment equals depreciation, find the steady-state level of capital per worker for each country. Then find the steady-state levels of income per worker and consumption per worker.

2. Consider an economy described by the production function \( Y = F(K, L) = K^{0.3}L^{0.7} \).
   a. What is the per-worker production function?
   b. Assuming no population growth or technological progress, find the steady-state capital stock per worker, output per worker, and consumption per worker as functions of the saving rate and the depreciation rate.
   c. Assume that the depreciation rate is 10 percent per year. Make a table showing steady-state capital per worker, output per worker, and consumption per worker for saving rates of 0 percent, 10 percent, 20 percent, 30 percent, and so on. (You will need a calculator with an exponent key for this.) What saving rate maximizes output per worker? What saving rate maximizes consumption per worker?

3. Assume that a country’s production is \( Y = K^{1/2}L^{1/2} \).
   a. What is the per-worker production function \( y = f(k) \)?
   b. Assume that the country possesses 40,000 units of capital and 10,000 units of labor. What is \( Y \)? What is labor productivity computed from the per-worker production function? Is this value the same as labor productivity computed from the original production function?
   c. Assume that 10 percent of capital depreciates each year. What gross saving rate is necessary to make the given capital-labor ratio the steady-state capital-labor ratio?
   d. If the saving rate equals the steady-state level, what is consumption per worker?