6. Contrast the production functions given below:
   a. Suppose that the production function faced by a 30-weight ball bearing producer is given by $Q = 4K^{0.5}L^{0.5}$, where $MP_K = 2K^{-0.5}L^{0.5}$ and $MP_L = 2K^{0.5}L^{-0.5}$. Do both labor and capital display diminishing marginal products? Does the production function display a diminishing marginal rate of technical substitution?
   b. Suppose that the production function faced by a 40-weight ball bearing producer is given by $Q = 4KL$, where $MP_K = 4L$ and $MP_L = 4K$. Do both labor and capital display diminishing marginal products? Does the isoquant you drew in (a) display a diminishing marginal rate of technical substitution?
   c. Compare your results. Must labor and capital display diminishing marginal products in order for the *MRTS* to diminish?
   d. Given the production function in part (a) of this problem, show that the marginal products are as given using calculus.
   e. Re-answer part (a) using calculus.
   f. Given the production function in part (b) of this problem, show that the marginal products are as given using calculus.
   g. Re-answer part (b) using calculus.