1. Write the equation for the marginal product of capital for each of the following production functions:
   
   a. \( Q = 3K + 2L \)
   
   b. \( Q = 4K^{0.5}L \)
   
   c. \( Q = 5K^{0.5}L - L \)

2. Draw a graph showing a set of isoquants that depict capital and labor to be perfect complements (not substitutable at all) in a production function that exhibits constant return to scale. Be sure to label the input and output levels on the isoquants.
3. Two firms currently produce the goods $q_1$ and $q_2$ separately. Their cost functions are $C(q_1) = 250 + q_1$ and $C(q_2) = 350 + 2q_2$. By merging, they can produce the two goods jointly with costs described by the function $C(q_1, q_2) = 450 + q_1 + q_2$. Are there scope economies in this case that would justify the merger?

