1. Let a firm have production function  where  are the inputs.
2. Sketch the isoquants. What is the MRTS (marginal rate of technical substitution).
3. Is  homogenous of some degree  What does this tell you about the return to scale under which the firm operates?
4. Set up and solve the firm’s profit maximization problem given prices ≫0 (here is the price of the output and the vector of factor prices).
5. Using your answer to the previous sub-question, find the level of output supplied to the market when

= (1,1,1) , 

1. Define and explain the notion of a (pure strategy) Nash equilibrium. Give an example of a game and find the Nash equilibrium.
2. Let be a homogenous of degree 1 production function for a firm.
3. Show that the firm faces constant returns to scale in production (include the definition of CRS in your answer).
4. Prove that the firm must earn zero profits when it maximizes profits. (Hint: assume that, given prices, the firm could earn strictly positive profits from some combination of the inputs . Then argue if so, the firm would want to use infinitely much of the inputs and could earn infinite profits. Contradictions).
5. Using the conclusion from (ii), show that if is profit maximizing given prices , then so is for any  (Hint: simply show that profits will also be zero for the input combination . Since zero is the maximal profit,  is then profit maximizing).