1) A stationery shop in India orders plastic erasers from a distributor in Germany. It takes two months to ship the erasers from Germany to India. The shop orders 2000 packs of erasers every six months (shipped on the first of January and the first of July).

1. a) Assuming the ordering policy the shop is using does not result in large build-ups of inventory or long-term stock-outs, what is the annual demand for the erasers?
2. b) Draw a graph of the pipeline inventory (i.e., the inventory ordered but not received) of the erasers for a year. What is the average annual pipeline inventory of erasers?
3. c) Multiply the replenishment lead time in years with the annual demand you obtained in part (a). What do you notice about the result that you obtain?

2) A large automobile repair shop installs about 1,250 mufflers per year, 18 percent of which are for imported cars. All the imported-car mufflers are purchased from a local supplier at a cost of $18.50 each. The domestic-car mufflers are purchased from a different supplier. The shop uses a holding cost based on a 25 percent annual interest rate. The setup cost for placing an order is estimated to be $28. Shortages are not allowed.

1. a) Determine the optimal number of imported-car mufflers the shop should purchase each time an order is placed, and the time between placement of orders.
2. b) The current reorder policy is to buy imported-car mufflers only once a year. What are the additional holding and setup costs incurred by this policy?
3. c) Take the replenishment lead time to be six weeks. Is there a simple way of modifying the optimal policy so that stock-out is prevented?