1. The operating cost of a truck is $12 + \dfrac{x}{6}$ cents per mile when the truck travels x miles per hour. If the driver earns \$6 per hour, what is the most economical speed to operate the truck on a 400 mile turnpike? Due to construction, the truck can only travel between 35 and 60 miles per hour.

2. A furniture business rents chairs for conferences. A contract is drawn to rent and deliver up to 400 chairs for a particular meeting. The exact number would be determined by the customer later. The price will be \$90 per chair up to 300 chairs. If the order goes above 300 chairs, the price would be reduced by \$0.25 per chair for every additional chair ordered above 300. This reduced price would be applied to the entire order. Determine the largest and smallest revenues this business can make under this contract.

3. The speed of traffic through the Lincoln Tunnel depends on the density of the traffic. Let S be the speed in miles per hour and D be the density in vehicles per mile. The relationship between S and D is approximately $S = 42 - \dfrac{D}{3}$ for $D \leq 100$. Find the density that will maximize the hourly flow.

4. A commercial cattle company currently allows 20 steer per acre of grazing land. On average a steer weighs 2000 pounds at the market. Estimates by the Department of Agriculture indicate that the average weight per steer will be reduced by 50 pounds for each additional steer added per acre of grazing land. How many steer per acre should be allowed in order to optimize the total market weight of the cattle?