

1. A city is planning to build a park along a major road. The park is to be rectangular with an area of 4000 square yards and will be fenced off on the three sides that are not adjacent to the road. What is the least amount of fence required for this job? How long and wide should the park be to minimize the amount of fencing used?
2. Suppose that  $x$  units of a commodity are produced at a total cost of  $C(x)$ . Show that the average cost is minimized when the average cost is equal to the marginal cost.
3. A cable is to be run from a power plant on one side of a river to a factory on the other side. It costs \$4 per meter to run the cable over land, while it costs \$5 per meter to run the cable under water. If the river is 300 meters wide and the factory is 1000 meters down stream from the power plant, what is the most economical route to lay the cable?