Problem:

I own a company that designs and sells many types of items. One of my employees has developed a new design for solar collection panels. Marketing studies have indicated that annual demand for the panels will depend on the price charged. The demand function for the panels has been estimated as: q=100,000-200p,

Where q = the number of units demanded each year and p = the price in dollars. Our annual production capacity is 20,000 units. Engineering studies indicate that the total cost of producing q panels is represented by the function: C=150,000+100q+0.003q^2.

I need your help in forming a profit function, P= f(q) , which states the annual profit P as a function of the number of units q which are produced and sold. I also need to know how many units should be produced to maximize annual profit, the price that I should charge for each panel to generate this maximum profit and the maximum profit possible.