Applications Revisited

Get into groups of two or three people and work on the front of this worksheet. *Do not* start on the back side yet.

- 1. You have started another widget company and set the prices so they depend on the quantity sold (discounts are given if someone buys in bulk). The revenue R to make q hundred widgets is $10 \ln(q+1)$. Furthermore, it costs $C(q) = (.15q+2)^2$ to make q hundred widgets.
 - (a) Assuming all the functions given above are reporting hundreds of dollars, what are the fixed costs of the company?
 - (b) Find the approximate revenue that selling 100 more widgets will make when production is already at 1500.
 - (c) Find the number of widgets to product that would maximize profit.

- 2. Production of an item has fixed costs of 10,000 and variable costs of 2 per item. The relationship between price p, and quantity, q demanded is *linear*. Market research shows that 10,100 items are sold when the price is 5 and 12,872 items are sold when the price is 4.50.
 - (a) Express the cost, C, of producing q items.
 - (b) Recall that the demand curve is *linear*. Express q as a function of price p.

- (c) Recall if you sell q items for p, then you will have $p \cdot q$ dollars of revenue. Use the work from (b) to express the revenue, R, from selling q items as *only* a function of q.
- (d) How many items should the company produce to maximize profit?