

Optimization: Economics

Goal:

- Can interpret the zeros of the derivative of some function.
- Can create an equation for geometrically connected objects.

Terminology:

- Revenue
- Cost
- Demand
- Quantity
- Marginal
- Elasticity

Reminder:

- Test on Feb 4th

Review: What is the dimension of the largest cone that can fit inside a sphere of radius R ?

Economists like their formulas when considering optimization of profit and cost. Not to get too hung up on the details there are a few important things a business would want to measure:

Characteristic	Dependent on ...	Example
Revenue		
Cost		
Profit		
Demand (Quantity)		

Optimize Profit (ideal quantity output)

Optimizing Cost (ideal quantity output)

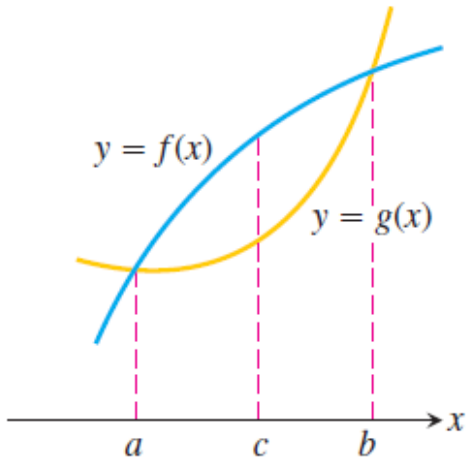
Optimizing Revenue (ideal selling price)

Practice Problems: 4.5: # 1-3, 5-7



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7. Let $f(x)$ and $g(x)$ be the differentiable functions graphed below. Point c is the point where the vertical distance between the curves is the greatest. Is there anything special about the tangents to the two curves at c ? Give reasons for your answer.



Solutions:

1. Area 0.5 square units; dimensions 1 by 0.5
2. Minimal surface area $r, h = 10/\sqrt[3]{\pi}$
3. Proportions $2r = \frac{8h}{4+\pi}$
4. Minimal cost $h = \left(\frac{3V}{\pi}\right)^{\frac{1}{3}}$
5. Land $\frac{4}{\sqrt{21}} = 0.87$ miles down the shoreline
6. 67 people
7. Consider the difference function and minimize it.