## Math 160 Session #2

A study of fertilizer plants in Indiana showed that for a medium-sized plant fixed costs were about \$367,000 and it cost approxiamately \$209 to produce each ton of fertilizer. In the study, a medium-sized plant produced between 4200 and 7800 tons per year. Revenue was estimated at about \$267 per ton. Under those conditions, and assuming all fertilizer produced is sold, at what production level will profits be zero? What is the profit or loss per ton if production is set at 6000 tons? 7000 tons?

Let's formulate a mathematical model for this situation.

(1)

(2)

•	t = the number of tons of fertilizer produced and sold.
	C(t) = the cost (\$) of producing t tons of fertilizer
	$\mathbf{R}(\mathbf{t}) =$ the revenue (\$) gained by producing and selling t tons of fertilizer
	P(t) = the profit (\$) gained by producing and selling t tons of fertilizer
	C(t) = variable cost + fixed costs, and variable cost = cost per unit (ton) x number of units (tons) produced
	=
	So,
	C(t) =
	<b>R</b> (t) = price per unit (ton) x number of units (tons) sold
	So,
	R(t) =

(3) P(t) = revenue – cost So, P(t) = \_\_\_\_\_

Complete the table below and then graph the cost and revenue functions.

Number of	Costs	Revenue	Profit
Tons	1000's of \$	1000's of \$	1000's of \$
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Produced (t)	C(t)	R(t)	P(t)
4200			
4800			
5400			
6000			
6600			
7200			
7800			

