Marginal Cost and Revenue Group Activity
(Nonlinear modeling and integration)

Acme Products produces over a million roadrunner bombs per year. Historical production and sales data indicate that marginal revenue R' and marginal cost C' are as given below for level of production x, where x is in millions of units. Revenue and cost are in thousands of dollars.

x	.6	1.0	1.3	2.0
R'(x)	204	300	351	400
C'(x)	77.46	100	114.02	141.42

(1) An inspection of this data indicates that R' can be modeled well with a quadratic and C' is approximately a power function. Use the regression features of your calculator to find R'(x) and C'(x):

R'(x) = _____ C'(x) = _____.

(2) It will take Acme one year to increase production from 2 million units to 3 million units. Use calculus (by hand or with your calculator) to find the total change in profit resulting from the increase from 2 to 3 million units.

Added Profit: _____

(3) In a short paragraph, explain what you did to arrive at your answer in problem (2).

(4) If you were on Acme's management team, would you recommend trying to increase production from 3 to 4 million in the next year? Why or why not? Use your marginal revenue and cost models to answer this question. Explain your reasoning in a short paragraph or two.