MAT 105 Quiz 2.7-2.8 (ivory) Fall 2009   Name ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Problems	1	2	Total		Grade
Points				%	
Out of	25	25	50		

Relax. You have done problems like these before. Even if these problems look a bit different, just do what you can. If you're not sure of something, please ask! You may use your calculator. Please show all of your work and write down as many steps as you can. Don't spend too much time on any one problem. Please leave the following grading key blank for me to use. Do well. And remember, ask me if you're not sure about something.

A few formulas from our book:

The Max-Min Formula

The max or min of $H = aT^2 + bT + c$ occurs when $T = \dfrac{-b}{2a}$.

The Quadratic Formula

The equation $H = aT^2 + bT + c = 0$ has solutions

$$T = \frac{-b}{2a} + \frac{\sqrt{b^2 - 4ac}}{2a} \quad \text{and} \quad T = \frac{-b}{2a} - \frac{\sqrt{b^2 - 4ac}}{2a}$$

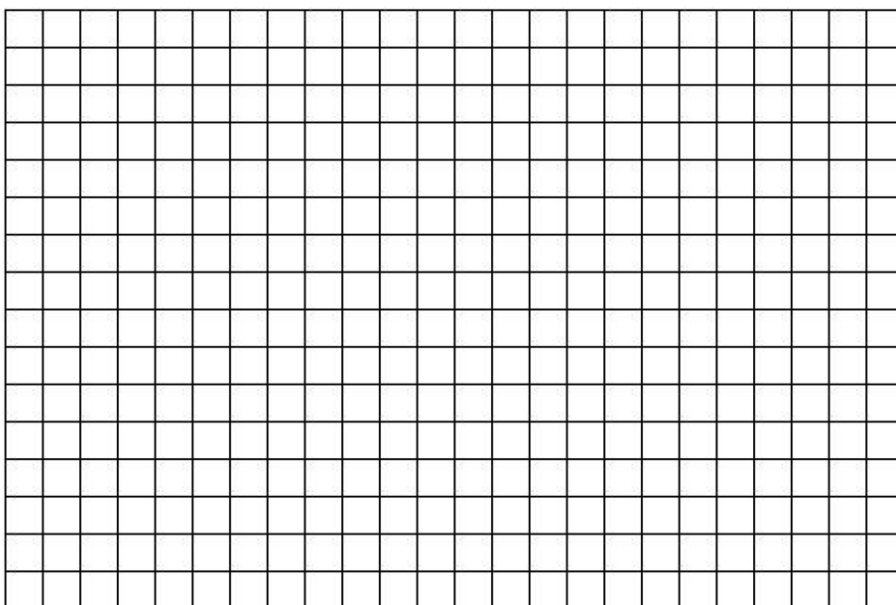1. Revenue from airline travel has been increasing. The total revenue R made is given by the equation

$$R = 22.16Y^2 - 71.71Y + 135.3$$

where R is number of annual revenue, in billions of dollars, and Y is the year since 2000.

(a) Calculate the missing values in the table.

Y	0	1	2	3	4	5	6
R	1310		1070	1179	1343		1649

(b) Draw a graph illustrating the dependence. Be sure to include enough space for all of your data and that your axes are evenly spaced. Draw in a smooth line connecting all of your data.

(c) According to this equation, in what year was the revenue the smallest? What was the revenue for that year? Show how to use the appropriate formula to calculate the revenue, according to the equation. *Be sure to show some work.*

2. Sales of compact discs (CDs) have been declining recently. The money M (in billions of dollars) made from CD sales Y years from 1996 is given by the following equation

$$H = 104.4 + 11.5Y - 1.4Y^2$$

(a) According to this formula, in what year will there be no money made on CD sales? Show how to use successive approximations to estimate the answer to the nearest year. *Display your work in a table and be sure to indicate your final answer.*

(b) Now show how to use the appropriate formula to calculate when there will be no money made from CD sales. *Be sure to show your work.*

The problem continues . . .

    (c) A company that manufactures the materials for compact disks will terminate production if sales fall below 20 billion dollars. In what year will that be? Show how to use the appropriate formula to calculate the answer. *Be sure to show your work. If you can't figure out how to use the formula, you may approximate it for possible partial credit.*