MAT 105 Quiz 2.7-2.8 (gray) Spring 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. The average increase in global temperature T in degrees Fahrenheit Y years since 1950 is approximated by the equation

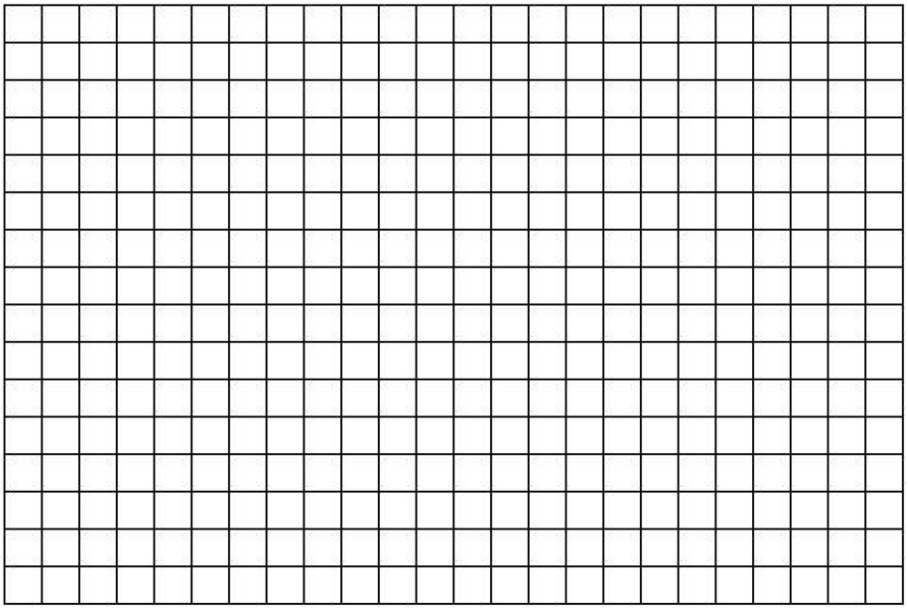
$$T = 0.0006Y^2 - 0.0089Y + 0.267$$

where T is the temperature change since 1950, in degrees Fahrenheit, and Y is the year since 1950.

(a) Calculate the missing values in the table.

Y	5	10	15	20	25	30	35
T	0.24		0.27	0.33	0.42		0.69

(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.



(c) According to this equation, in what year will there be the smallest (lowest) temperature change since 1950? How big will the temperature change be? Show how to use the appropriate formula to calculate how the temperature change, according to the equation. *Be sure to show some work.*

2. Aimee was so happy at graduation she threw her hat into the air. The height H feet of her hat T seconds after it is thrown straight up in the air is given by the equation

$$H = 3 + 15T - 16T^2$$

(a) When will the hat hit the ground? Show how to use successive approximations to estimate the answer to the nearest tenth of a second (one decimal place). *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 the hat will hit the ground. *Be sure to show your work.*

The problem continues ...

(c) When is the hat 1 foot from the ground? 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.*