
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 $T = \frac{-b}{2a}$.

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

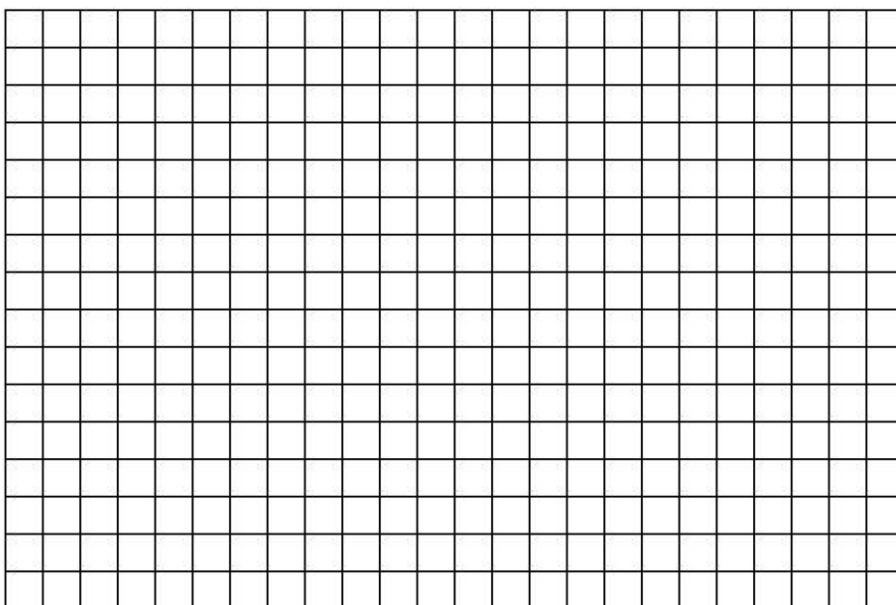
$$R = 22.16Y^2 - 72.71Y + 1235.3$$

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	1235		1179	1217	1299		1597

- (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. A ball is dropped off the observation deck of the CN Tower located in Toronto, Canada. The height H (in meters) of the ball T seconds after it is released in the air is given by the equation

$$H = 449 + 1T - 4.90T^2$$

- (a) When will the ball hit the ground? Show how to use successive approximations to estimate the answer to the nearest second. *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 ball will hit the ground. *Be sure to show your work.*

The problem continues . . .

- (c) Professor Zobitz is on the street looking up at the CN Tower when he notices the ball coming towards him. Since he is approximately 2 meters (\approx 6 feet) tall, when is the ball 2 meters 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.*