Math 174, Spring 2010
Group Solve #2

Name: ________________________________  Score: ___

Remember: show all appropriate work clearly and write all explanations in complete sentences.

1. a) The table below shows the annual net revenue for Big-Money Inc. in millions of dollars from 1990 to 2000.

<table>
<thead>
<tr>
<th>t (Years since 1992)</th>
<th>R(t) (Millions of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td>500</td>
</tr>
<tr>
<td>4</td>
<td>700</td>
</tr>
<tr>
<td>5</td>
<td>1000</td>
</tr>
<tr>
<td>6</td>
<td>1300</td>
</tr>
<tr>
<td>7</td>
<td>1700</td>
</tr>
<tr>
<td>8</td>
<td>2200</td>
</tr>
<tr>
<td>9</td>
<td>2700</td>
</tr>
<tr>
<td>10</td>
<td>3300</td>
</tr>
</tbody>
</table>

Plot the data points on your calculator.

Calculate the following regression models (round coefficients to the nearest hundredth place). Be sure to use proper function notation based on the information above.

Linear: ________________________________

Quadratic: ________________________________

Exponential: ________________________________

2. a) By analyzing the graphs, which model appears to most closely fit the data? Compare the actual graphs of the models to the data points. (Do not refer to $r$ or $R^2$ values.) Explain why you chose the model you did.

b) Use the model from 2a to find and interpret $R(15)$. 
3. Jason’s pension is an annuity with a guaranteed return of 11% per year, compounded monthly. He can afford to put $400 per month into the fund, and will work for 40 years before retiring.

For each part, show **exactly** what you enter into your calculator and solve for the appropriate variable. Answer the questions in complete sentences.

a) How much will Jason accumulate after 40 years?

```
N = ___________
I% = ___________
PV = ___________
PMT = ___________
FV = ___________
P/Y = ___________
C/Y = ___________
```

b) If the pension is then paid out monthly, based upon a 15-year payoff, how much will Jason receive per month?

```
N = ___________
I% = ___________
PV = ___________
PMT = ___________
FV = ___________
P/Y = ___________
C/Y = ___________
```
4. Suppose you deposit $2,000 in an account that pays 9% annual interest compounded continuously. How long will it take for your account to be worth $30,000? (Round the answer to the nearest day, as we did in class.)

Set up the equation here and solve it algebraically, showing all steps.

5. The revenue function for a new software package is given by \( R(p) = -40p^2 + 12600p \), where \( p \) is the price charged per package. The cost function is given by \( C(p) = -200p + 90000 \).

a) Write the profit function for the company. Show all steps.

b) What is the largest monthly profit possible? At what price does it occur? Explain and show work.