**Problem 1 – Ride the Rollercoaster**

1. Based on the scatter plot appearance, what type of polynomial equation might reasonably be chosen to represent these data?

2. What equation resulted from your first regression choice? How did it fit the data?

3. What equation resulted from your second regression choice? How did it fit the data?

4. After viewing the two equations graphed on top of the scatter plot, which appears to best fit the data?

5. Compare the values of $R^2$ for the two regressions. Based on these values, which equation provides the best fit to the rollercoaster data?

6. According to the equation that best fits the rollercoaster data, what is the maximum height you can expect to reach on this portion of the rollercoaster track?

7. When you've travelled 500 feet horizontally, what height do you expect according to your equation? Does this make sense? Explain.

8. If the rollercoaster were to roll backward, what would you expect the height to be 20 feet back ($x = -20$)? Does this make sense? Explain.

**Problem 2 – The Financial "Rollercoaster"**

9. Based on the scatter plot appearance, what type of polynomial equation might reasonably be chosen to represent these data?

10. What regression equation best fits the given NASDAQ data?

11. A high NASDAQ index value generally indicates economic health. At what time during this day was the index most favorable? What was the approximate index value at this time?

12. If this data set gave index values for today, based on the graph and the equation you found to represent the data, what kind of values should be expected for tomorrow? How about yesterday? Is this reasonable? Explain.

**Problem 3 – The Gas Prices "Rollercoaster"**

13. Based on the scatter plot appearance, what type of polynomial equation might reasonably be chosen to represent these data?

14. What regression equation best fits the given gasoline price data?

15. Based on your equation model, what price might be expected for gasoline during the last week of the year (week 52)?

16. Based on this model, what would the price of gas have been at the beginning of 2007 ($x = -52$)?

17. While the regression equation obtained may provide a reasonable fit to the given data, what problem(s) would be involved with extrapolating beyond the given data values?