**Mathematical Modeling**

Data Sheet

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**Part I.**

Linear fit of data set 1. Line equation: **y = 0.83x + 2.8**, r2 value: **0.96**

Linear fit of data set 2. Line equation: **y = 0.86x + 3.1**, r2 value: **0.82**

Which data set is better described by the linear trendline?  Why?

**Set one has a higher r2 which means the values have less variance.**

Using the trendline from data set 1, what is the predicted x-value (for the y=2.25 value): **-0.66**

Using the trendline from data set 2, what is the predicted x-value (for the y=2.25 value): **-0.99**

Which predicted x-value should you have more confidence in?  Why?

**I would stick with the data set 1 because of the reasons above.**

**Part II.**

Linear fit of data set 3. Line equation: **y = 0.63x + 1.4**, r2 value: **0.39**

Does the linear fit seem like a good fit of data set 3? (Y/N) Why?

**The r2 value is very low, so I would say it’s a bad fit.**

* + 1. Quadratic fit of data set 3. Line equation: **y = -0.185x2 + 1.15x + 5.9,** r2 value: **0.72**

Does the quadratic fit seem like a good fit of data set 3? (Y/N) Why?

**It’s definitely better than the linear fit, but it’s still not great.**

Linear fit of data set 4. Line equation: **y = 0.48x + 1.4**, r2 value: **0.46**

Does the linear fit seem like a good fit of data set 4? (Y/N) Why?

**Pretty bad fit. High variance / low accuracy.**

Quadratic fit of data set 4. Line equation: **y = 0.016x2 + 0.47x + 0.8**, r2 value: **0.46**

Does the quadratic fit seem like a good fit of data set 4? (Y/N) Why?

**It’s ever so slightly better, but still not a great fit.**

Cubic fit of data set 4. Line equation: **y = 0.040x3 + 0.011x2 – 1.76x + 0.4**, r2 value: **0.99**

Does the cubic fit seem like a good fit of data set 4? (Y/N) Why?

**It’s a near perfect fit. The values are all pretty much on the trendline.**