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Mont 106N

11/19/09

SMA Data

1. No, there is no linear relationship between population and rank. Because the residual graph has a definite pattern
2. There is also no linear relationship for ln(y) and x. Again, the residual plot has a pattern.
3. There is a linear relationship between ln(y) and ln(x). You can see this because there is not much of a relationship of the residual plot, the points are scattered, opposed to the other residual plots where the points are more in a line.
4. If you did this then the plot would be a lot more linear because the data would be more closely related throughout the data set. This would also make the residual plot more scattered and thus show a stronger relationship.
5. There is still the same linear relationship. The equation is y=x-1.12+e19.5

Semiconductor Data

1. I used the standard deviation of the data for each wafer in order to measure the uniformity.
2. Yes, you could say that the data from Location 13 can be considered an outlier in the data set. If you look at the data from Location 13 compared to the other twelve locations’ data, you can see that Location 13’s data is close to 200 angstroms less for every measurement. This could have happened for many reasons in the experiment or it could have just been an anomaly, either way, I think it is justified to throw out data in Location 13.
3. After doing the data analysis, I found the final equation. The SD is “y” and the data analysis gives you the values for m; m1=-.072 and m2=1.21. The data analysis also gives you the intercept, b=115.86. So y=-.072x1+1.21x2+115.86
4. Yes, the relation is a good fit for the data because the graphs are football shaped and the plot of the residuals is scattered, thus showing a good relation as well.
5. Since m1 has a negative slope, which is almost zero, it shows that oxide thickness is not very significant because the coefficient is so small. Since m2 has a more substantial coefficient, it shows that deposition time is more significant in determining the measure of polysilicon thickness uniformity.