Today, we will:

- Do some more example problems – regression analysis
- Review the pdf module: **Outlier Points** and do some example problems

Example: Regression Analysis

Given: Twenty data points of (x,y) pairs with lots of scatter (see Excel spreadsheet on website for the raw data).

Data point	x	y
1	0	1.924
2	0.1	2.377
3	0.2	2.088
4	0.3	3.245
5	0.4	3.031
6	0.5	2.779
7	0.6	3.186
8	0.7	4.102
9	0.8	4.278
10	0.9	3.701
11	1	3.654
12	1.1	3.991
13	1.2	3.891
14	1.3	3.790
15	1.4	3.437
16	1.5	4.080
17	1.6	3.204
18	1.7	3.130
19	1.8	2.614
20	1.9	2.066

To do: Perform regression analysis – linear, quadratic, and cubic – and compare how the fitted curves fit to the data points.

Solution:

See Excel spreadsheet – I will show in class how to do the regression analysis in Excel.

Example: Outliers – single set of data

Given: Four data points are measured.

Data point	x
1	38
2	42
3	44
4	53

sample mean = 44.25
sample standard deviation = 6.3443

To do: Eliminate any "official" outliers, one at a time.

Solution:

Example: Outliers – single set of measurements

Given: Janet takes 12 temperature measurements ranging from 23.0°C (lowest reading) to 25.7°C (highest reading).

- The sample mean of all 12 readings is 24.88°C.
- The sample standard deviation is 1.04°C.

To do: Is there an "official" outlier?

Solution:

Example: Outliers – single set of measurements

Given: Eleven measurements of pump efficiency are taken (listed in increasing order below):

58, 72, 74, 74, 76, 77, 80, 80, 82, 85, and 92%

(*a*) **To do**: Are there any "official" outliers? If so, remove them. How many "good" measurements are left?

(*b*) **To do**: Based on the measurements that are left, estimate the population mean and its confidence interval to 95% confidence.

(*c*) **To do**: Based on the measurements that are left, estimate the population standard deviation and its confidence interval to 95% confidence.

Solution: