Sec 2-4 and 5-1:

Linear and Quadratic Regressions.

Regression means to find an equation.

Correlation Coefficient: r

A statistic that measures how good of a fit an equation is for a set of data.

Positive Correlation

As x increases,
y increases

Pos Slope

Negative Correlation

As x increases,
y decreases

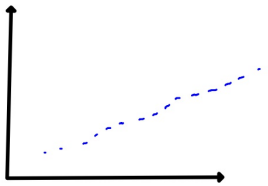
Neg Slope

No Correlation

No relationship between quantities

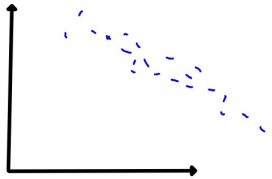
Type here

Strong Correlation



All points

Weak Correlation



Make a Scatter plot on the Graphing Calculator:

1st Enter the data into a list:
STAT
EDIT
Put x into L_1 and y into L_2

2nd Turn a scatter plot on:
2ND
Y=

3rd To set up a good window:
ZOOM 9:ZoomStat

Linear Regression

Press STAT

Move to CALC

Choose Option 4: LinReg(ax+b)

At the bottom of the screen you shuld see r =

this is the value of the correlation coefficient.

Hours Spent Studying	Math SAT Score
4	390
9	580
10	610
14	690
4	410
7	530
12	600
16	780

Make a scatter plot.

Does this data look linear or quadratic?

Linear

Find a regression equation for the data.

$y = 29.15x + 296.78$

1. What score would you expect if you studied for 17 hours?

≈ 792

2. How many hours should you study if you want to get at least 700 on Math SAT?

$700 = 29.15x + 296.78$

$x = 13.83$ hrs

r Correlation Coefficient

r > 0 positive correlation
r = 1 Perfect positive correlation

r < 0 negative correlation
r = -1 Perfect negative correlation

The closer r is to +1 or -1 the better the fit.

If the scatter plot looks like part of a parabola....

Quadratic Regression

STAT

CALC

5:QuadReg

A toy rocket is shot upward from ground level. The table shows the height of the rocket at different times.

Time (sec)	1	2	3	4
Height (ft)	105	507	752	832

Make a scatter plot.

Does this data look linear or quadratic? Quadratic

Find a regression equation for the data. $y = -80.5x^2 + 645.1x - 460$

Find the height after 1.5 sec.

≈ 326.5 ft