Warm Up:

If $x = 3i$, $y = 2i$, and $z = m + i$, then evaluate x^2yz.

$(3i)^2(2i)(m+i)$

$9i^2(2i)(m+i)$

$18i^3(m+i)$

$18mi^3 + 18i^4$

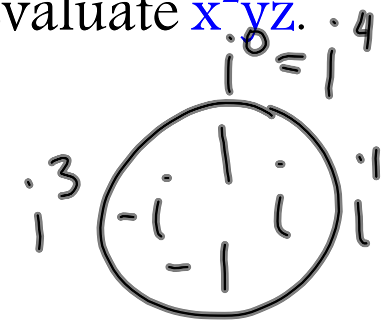
$18m(-i) + 18(1)$

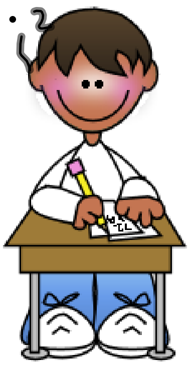
$-18mi + 18$

$18 - 18mi$

$(3i)^2$

-9

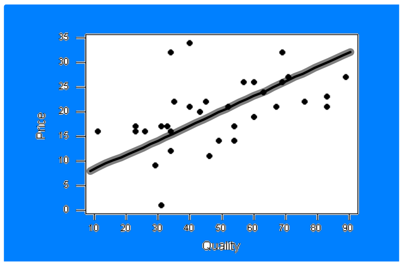




Unit 7:
Regressions,
Sequences &
Series

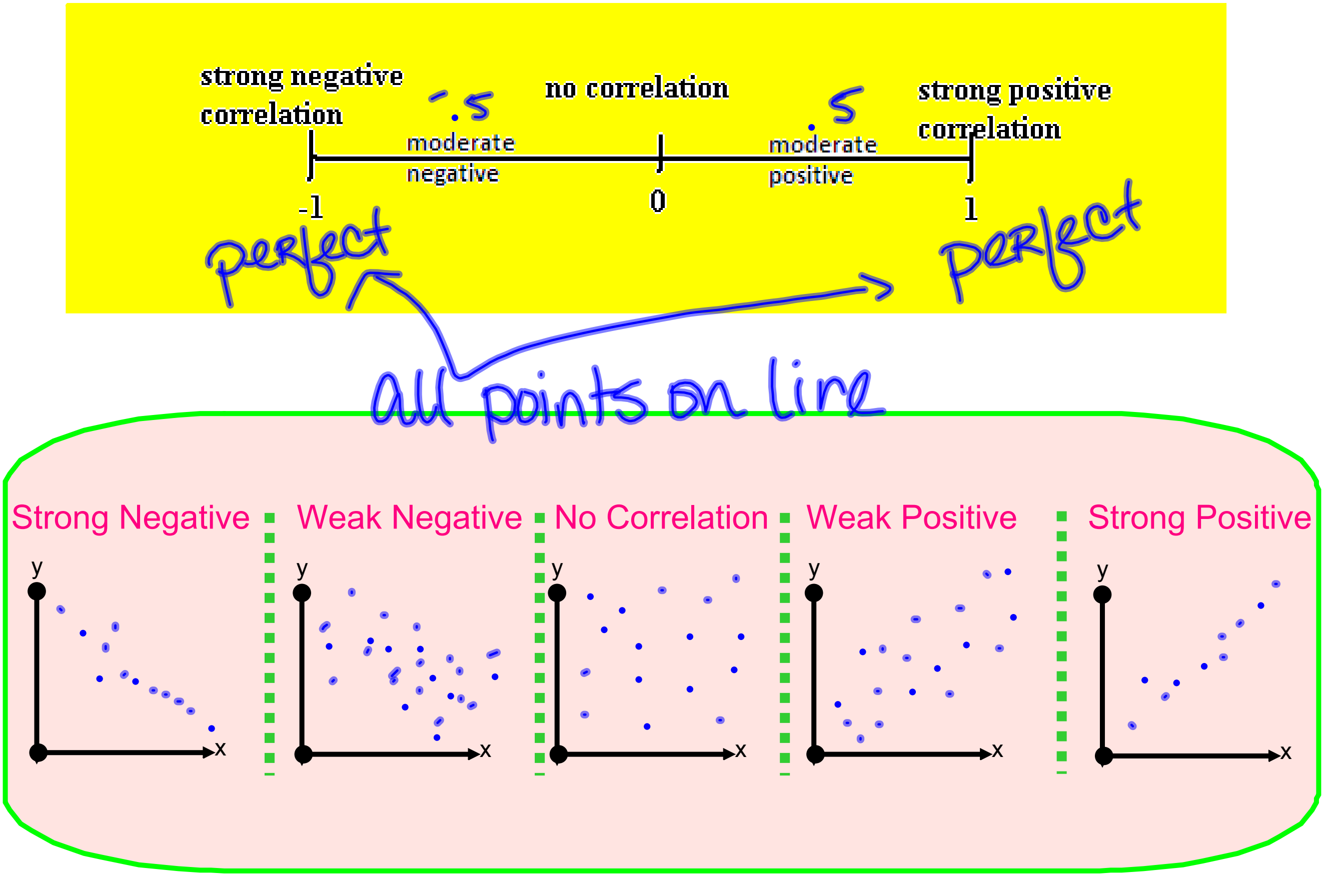
Scatter Plots & Regressions

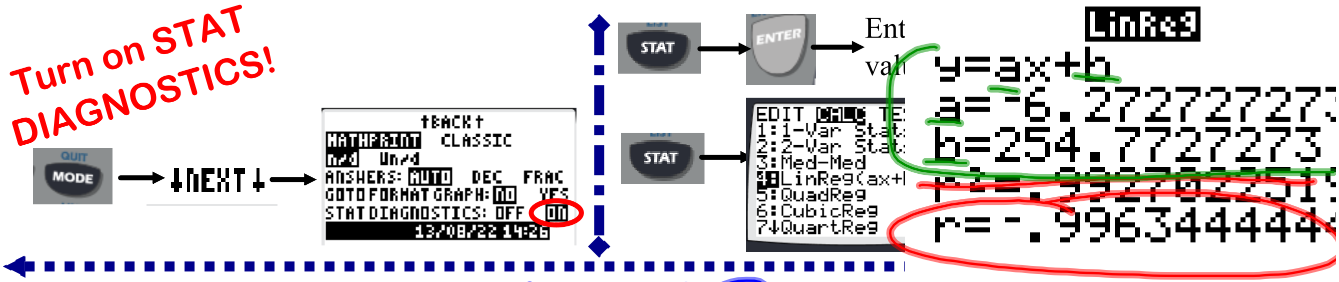
Scatter Plot:



line of best fit- Regression (line that approximates the data)

correlation- (r) how it closely the data fits Regression line


strong negative correlation
-.5
moderate negative
no correlation
.5
moderate positive
strong positive correlation
-1
0
1
perfect
perfect
all points on line
Strong Negative
Weak Negative
No Correlation
Weak Positive
Strong Positive



Example: LINEAR

1) Jeremiah joined an exercise program to try to lose weight. Each month he records the number of months in the program and his weight at the end of that month.

x **Month** L_1	1	2	3	4	5	6	7	8	9	10	11	12
y **Weight** L_2	248	242	237	228	222	216	216	206	197	193	185	178

a) Describe the correlation. Negative, Strong

$r = -.99$

b) Write the regression equation. $y = -6.27x + 254.77$

c) Predict what Jeremiah's weight would be in the 13th month if he contiued losing weight at this rate.

$y = -6.27(13) + 254.77$

$\boxed{y = 173.26}$

d) During what month would Jeremiah be down to 150 lb if he continued the same rate of weight loss?

$150 = -6.27x + 254.77$

```
150-254.77
              -104.77
Ans/-6.27
          16.70972887
```

during 16th month

Calculating Regressions
(Other than Linear)

Type of Function:	Where to find it in the calculator:	Properties:	Increasing Picture:	Decreasing Picture:
Quadratic	5:QuadReg			
Cubic 3rd deg	6:CubicReg			
Quartic 4th deg.	7:QuartReg			
Logarithmic	9:LnReg	$x > 0$	—	—
Exponential	0:ExpReg	$y > 0$		
Power $y=ax^b$	A:PwrReg	crosses (0,0)	—	—

Determining the MOST appropriate model for the data

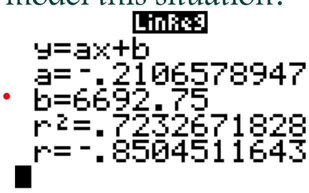
Kyle finds data on the Internet about carbon dating. The following table shows the years since an organism's death and the concentration of C^{14} atoms in the organism. Which type of regression would best model this situation?

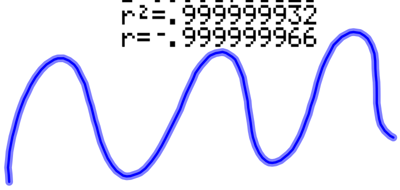
(a) linear r = -.8504...

(b) logarithmic ERROR

(c) exponential r = -.9999...

(d) trigonometric





Years since death	C^{14} atoms remaining per $1.0x10^8$ atoms
0	10,000
5,700	5,000
11,400	2,500
	1,250
22,800	625
28,500	312
34,200	156
39,900	78

Therefore, the way we determine the most appropriate model is ...

r- value

(correlation closest to ±1 is the best fit)