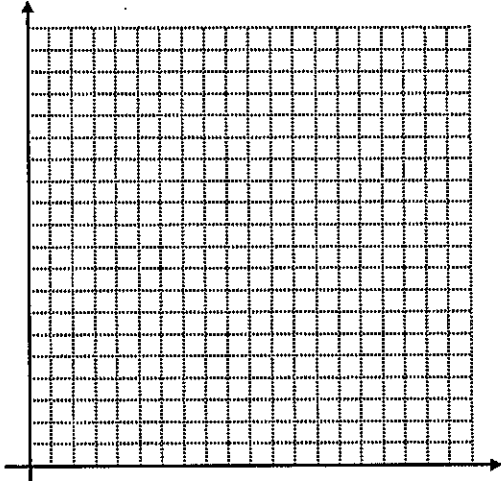


Regression & Lines of Best Fit

Do Now: Plot the following data and determine the type of correlation:

Hours Studied	.5	.5	1	1.5	1	2	2.5	2
Test Grade	70	75	80	90	85	90	95	100



Steps for Graphing Bivariate Data and Finding Lines of Best Fit

*(Turn Diagnostic on by going to the CATALOG 2ND 0)

**We only need to do this after the memory is Reset

1. Choose STAT – 1:Edit
2. Input data into L1(x-values) and L2(y-values)
3. QUIT
4. Choose STATPLOT(2ND y =)
5. Select Plot 1
6. To graph scatter plot 9: ZOOMSTAT
7. Choose STAT – scroll over to CALC - Choose 4: LinReg($ax + b$)
8. LinReg($ax + b$) ENTER

L1	L2	L3	2
1	70		
2	75		
3	80		
4	90		
5	85		
6	90		
7	95		
8	100		

L2(1)=1.4

```

ZOOMSTAT Plot2 Plot3
Off
Type: [ ] [ ] [ ] [ ]
[ ] [ ] [ ] [ ]
Xlist: L1
Ylist: L2
Mark: [ ] + .
    
```

```

EDIT [ ] [ ] TESTS
1: 1-Var Stats
2: 2-Var Stats
3: Med-Med
4: LinReg(ax+b)
5: QuadReg
6: CubicReg
7: QuartReg
    
```

Example 1: A survey was taken of 10 lows and high temperatures, in Fahrenheit, in the month of April to try to establish a relationship between a day's low temperature and high temperatures.

Low Temperature, x	26	28	30	32	34	35	37	38	41	45
High Temperature, y	49	50	57	54	60	58	64	66	63	72

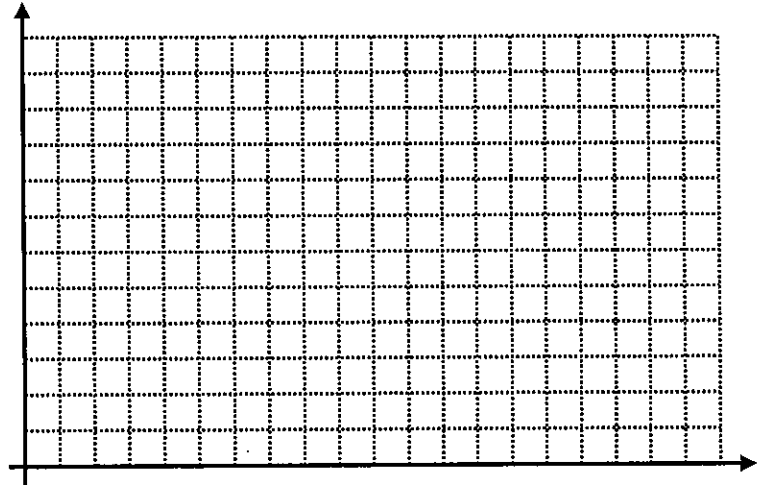
- Graph using your calculator.
- Use your calculator to find the equation for the line of best fit. Round the slope of the line to the nearest hundredth and the y -intercept to the nearest integer.
- What does the y -intercept represent in terms of the low and high temperatures?
- How would you interpret the slope of this model in terms of how the low and high temperature changes with respect to each other?
- Graph the equation of the line of best fit with the scatterplot. Interpret the graph.

Example 2: Generally, the fuel efficiency of a car changes with the weight of the car. A survey of some cars with their weights and gas mileages is shown below.

Weight (1000's of lbs)	3.7	4.5	3.2	5.1	6.8	4.9	4.8	5.5
Mileage (miles per gallon)	38	26	48	24	18	30	28	21

a) Find the equation for the line of best fit using your calculator. Round both coefficients to the nearest tenth. What do both variables represent in this problem?

b) Create a graph of the scatter plot for this data. Is the correlation between weight and mileage positive or negative? Explain



c) Which parameter of the linear model predicts whether the correlation is positive or negative?

d) If a car had a weight of 4,300 pounds, what would this model predict as its fuel efficiency? Round to the nearest integer.

e) If we wanted to purchase a car that got 40 miles to a gallon, what weight of car, to the nearest 100 pounds, should we purchase?