TOPIC: SCATTERPLOTS & CORRELATION

Interpreting Scatterplots

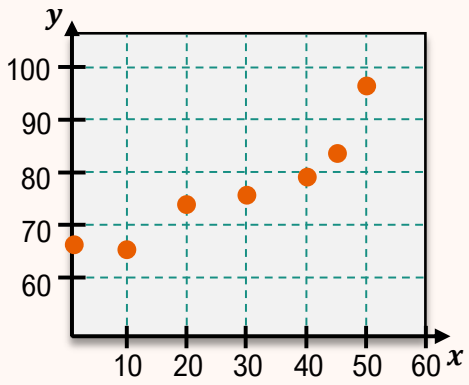
◆ **Scatterplots** are graphs of _____ numerical data with one *independent* (__) & one *dependent* (__) variable.

► x & y are **correlated** if their data pts form a _____. **Linear Correlation:** Trend = straight line.

EXAMPLE A teacher takes a survey of students to determine factors which might affect test scores. The data is listed in tables below. Plot the data if necessary and determine what type of correlation each graph has.

_____ Correlation

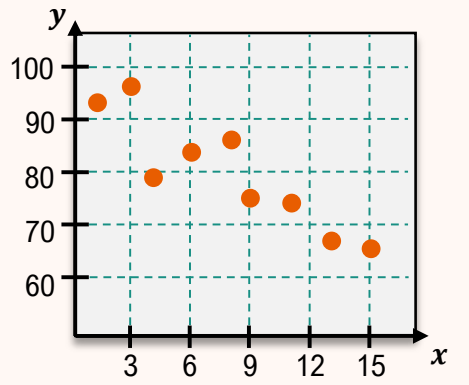
Test Scores vs Time Studying (min)									
Time	50	60	0	40	45	30	50	10	20
Score	86	92	67	79	83	75	96	65	73



As x ↑, y **[↑ | ↓]** Slope = **[POS | NEG]**

_____ Correlation

Test Scores vs # of Pins on Backpack									
Pins	8	1	13	4	6	9	3	15	11
Score	86	92	67	79	83	75	96	65	73

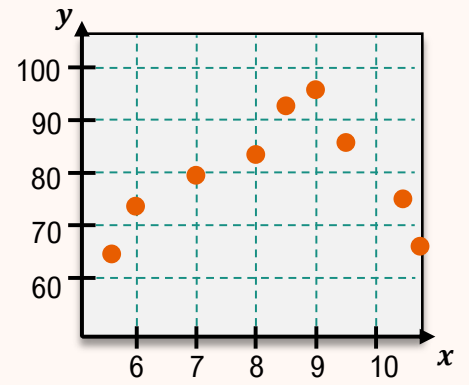


As x ↑, y **[↑ | ↓]** Slope = **[POS | NEG]**

◆ Two variables can *look* related without being cause & effect. "Correlation does NOT imply _____!"

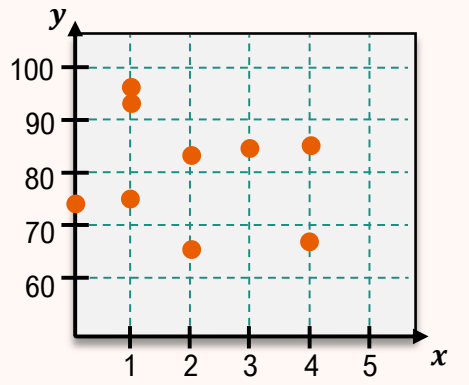
_____ Correlation

Test Score vs Time Sleeping (hrs)									
Time	9.5	8.5	11	7	8	10.5	9	5.5	6
Score	86	92	67	79	83	75	96	65	73



_____ Correlation

Test Score vs # of Siblings									
Siblings	4	1	4	3	2	1	1	0	2
Score	86	92	67	79	83	75	96	65	73



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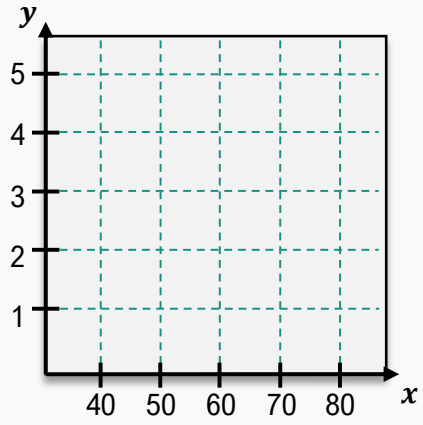
PRACTICE

The table shows the mean driving speed of drivers in a 55 mph zone and the number of speeding tickets they've received in the past 10 years. Plot the data in a scatterplot with speed on the x-axis. What can you determine about the relationship between mean speed and the number of speeding tickets?

Mean Driving Speed vs # Speeding Tickets										
Mean Speed	63	59	65	47	53	57	78	67	62	56
# Tickets	4	5	3	1	0	2	6	3	2	1



EXAMPLE

Match each data set to its scatterplot. Describe the correlations of each data set.

(A)

x	0	3	1	5	2	4
y	10	2	4	12	1	5

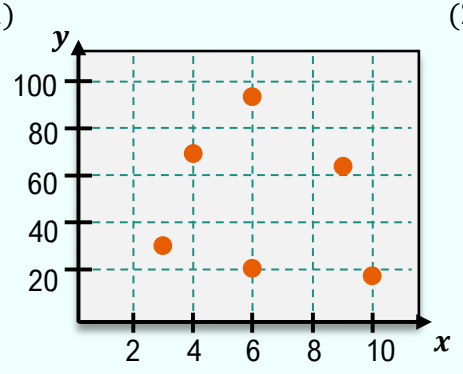
(B)

x	5	21	14	17	8	10
y	91	58	68	81	94	79

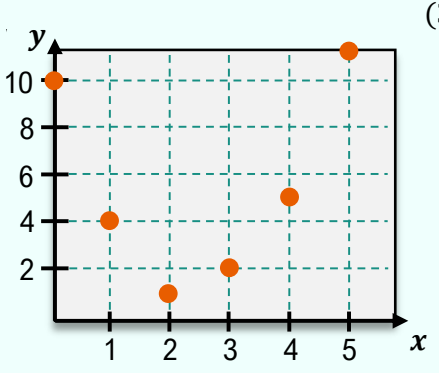
(C)

x	3	9	6	4	10	6
y	29	64	21	79	18	93

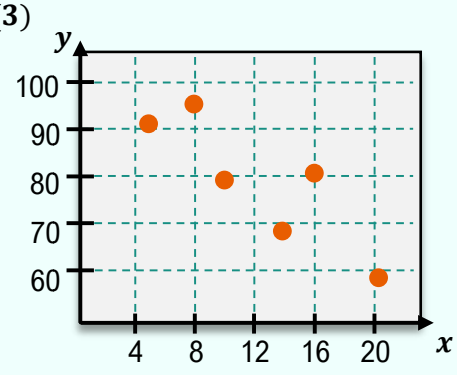
(1)



(2)



(3)



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Creating Scatterplots - Graphing Calculator

◆ To plot data using a calculator, enter the data as LISTS **L1** & **L2**, then turn on **PLOT1** using **STATPLOT**.

EXAMPLE

Create a scatterplot of the data using a calculator. Set time as the x-axis.

Test Scores vs Time Studying (min)									
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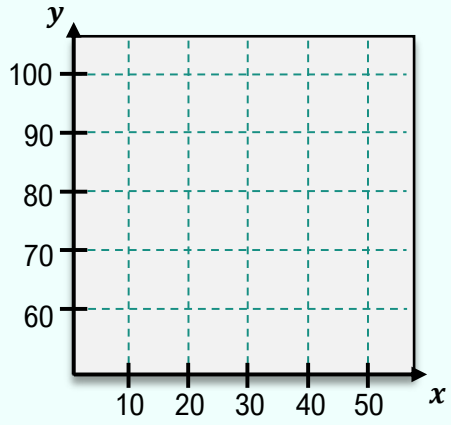
Score	86	92	67	79	83	75	96	65	73



HOW TO: Create a Scatterplot on TI-84

1) STAT, **1:Edit…**

Enter data in **L1** (__) & **L2** (__)

2) 2ND y= (stat plot), **1: Plot1…**

3) **On**, ∨ **Xlist:L1**, ∨ **Ylist:L2**

4) WINDOW, **Xmin=** , **Xmax=** , etc.

5) GRAPH

PRACTICE

Engineers are studying how cargo weight affects the flight duration of a delivery drone. The data below shows the cargo weight (pounds) and the corresponding flight time (minutes) for 12 test flights. Generate a scatterplot using a graphing calculator with cargo weight as the x-axis. Is there a correlation between cargo weight and flight duration?

Cargo Weight vs. Flight Duration												
Cargo Weight	1	7	8	4	2	3	9	6	2	6	2	5
Flight Duration	62	45	43	53	59	56	41	48	60	47	51	38

(A) Positive correlation

(B) Negative correlation

(C) Nonlinear correlation

(D) No correlation