

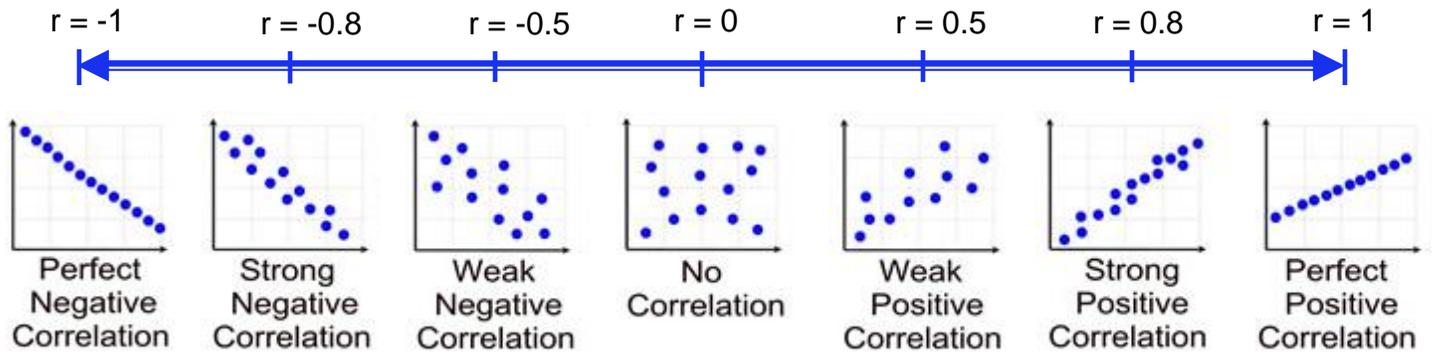
REGRESSIONS – Day 1

Recall that when scatter plots have a positive or negative correlation, you can draw a trend line to estimate the data. The trend line that shows the relationship between two sets of data most accurately is called the **line of best fit**. A graphing calculator computes the equation of the line of best fit using a method called **linear regression**.

The graphing calculator also gives you the **correlation coefficient** r , a number from -1 to 1 that tells you how closely the equation models the data. To see r , turn “Diagnostic On” in your calculator. Here’s how:

2ND 0 x⁻¹ DiagnosticOn ENTER ENTER
 ↘ (the “D” button)

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



Example 1: The table shows the heights and arm spans of 6 different men.

Height (ft)	4.9	5.9	5.6	6.6	5.6	6.9
Arm Span (ft)	4.6	5.6	5.6	6.2	5.2	6.6

$r =$ _____ Is there a strong or weak correlation?

Is the correlation positive or negative?

Example 2: The table shows the shoe size and salary of 6 different people.

Shoe Size	7.5	8	6.5	9	9	10
Salary (in thousands)	40	65	85	32	45	63

What does the correlation coefficient for the data indicate about the strength of the linear association between the salary and shoe size of these people?

- | | |
|--------------------------------|--------------------------------|
| A. Weak negative correlation | C. Weak positive correlation |
| B. Strong negative correlation | D. Strong positive correlation |

Example 3: The scatterplot shows a comparison between the test grades for 8 students in a history class and the time each student spent studying.

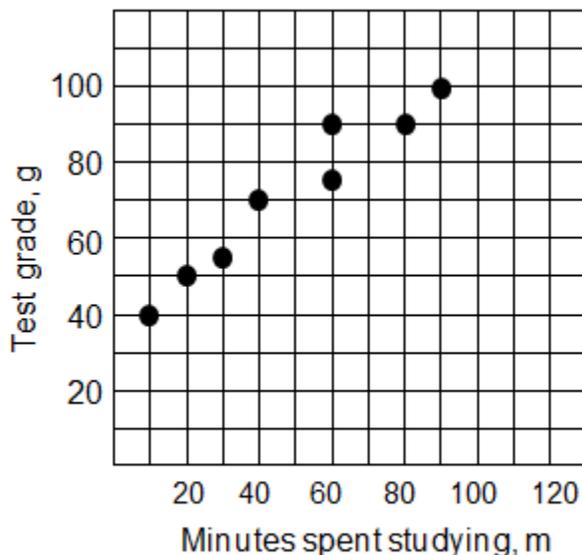
a) What type of correlation does the scatterplot show?

b) Make a table representing the relationship.

m	g
10	
20	
30	
40	
60	
60	
80	
90	

c) Which function best models the data shown?

- A. $g = 0.73m + 35.57$
- B. $g = 0.52m + 25.23$
- C. $g = -1.2m + 35.57$
- D. $g = -0.65m + 34$



$r =$ _____ Strong / Weak
Positive / Negative

d) What is a reasonable estimate of the test grade for a student who spent 50 minutes studying?

Example 4: The scatterplot shows the monthly high temperatures for Austin, Texas, in degrees Fahrenheit over a 12-month period.

a) Which month had the highest temperature?

b) What was the lowest monthly high temperature during the year?

c) Which function best models the data from Month 1 to Month 9?

- A. $y = -1.6x + 111$
- B. $y = 3.5x + 85$
- C. $y = 2.5x + 90$
- D. $y = -3.3x + 130$

d) Predict the monthly high temperature in Month 2 of the following year.

