**r = 1 Strong Positive: / r = 0 Weak or NONE r = -1 Strong Negative: \**

**(The Steps, Options and Commands may be different depending on if you are using a: TI-83, TI-84, TI-84 Plus or TI-84-e)**

When plotting points on a scatter plot, sometimes there is a true Linear Relationship which can be expressed as the equation: **y = mx + b.**

The ‘**m**’ is the **SLOPE** of the Line or the relationship between the ‘x’ and ‘y’ values:

**Slope = m = ‘b’ is the value of ‘y’ when ‘x’ = 0**

Linear Equations can have a **Positive Slope (Right Arm: /)**, **Negative Slope (Left Arm: \)** and **No Slope (0).** If the Equation of the line can **predict every ‘y’ (output) for every (x) input**, the **CORRELATION COEFFICIENT** **(r) is 1**.

The Stronger the relationship, the closer it is to **‘1’**. (Anything between |.9 and 1| is strong.

The weaker the correlation, it is to zero (0).

The Correlation Coefficient only expresses the Relationship between data and not CAUSATION!

One of the hardest parts is to enter the data and remember the different steps to perform!

[STAT]

{1: Edit} [Enter]

Enter data for L1 = **x values** and L2 = **y values**.

(**Warning:** You have to enter data in COLUMNS, and not as ordered pairs!)

[STAT] {CALC}. Select {**4: LinReg (ax + b)**. [Enter]

Verify Data Ranges for X (L1) and Y (L2)

Highlight the **<Calculate>** option and press <Enter>

Gives you: Y = ax + b. where **a** is the SLOPE and **b** is the intercept

Slope (a) = 2.63 b = 5.38

[STAT]. {TESTS}. Scroll down to option: **{F: LinRegTTest}** and press <enter>

Scroll down to the {**Calculate**} and press <enter>

Scroll down to find ‘r’ = .97

**Question# 16** on the Math-1 EOG has 6 data points. It says to removed ONE point (A, B, C, or D) and got a linear model that more closely modeled the data. **What Point was removed?**

The table goes ‘down’ but to save space, I typed it across:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X (L1) | 2.3 | 4.2 | 5.1 | 6.4 | 8.2 | 8.5 |
| Y (L2) | 11 | 16.5 | 19.2 | 23.1 | 24.3 | 29.5 |
| Points | 1. {2.3, 11} | B) {4.2, 16.5} |  | C) {6.4, 23.1} | D) {8.2, 24.3} |  |
|  | ~ **4.7** | ~ **3.9** | ~3.76 | ~ **4.5** | ~ **2.9** | ~ 3.47 |

WHICH POINT APPEARS TO BE AN OUTLIER? **y/x** (D is 2.9 and others are closer to ‘4’)

When you remove the points and recalculate (**r**) you get:

**Removing Point:** A, r 🡪 **.94** B: r 🡪 .**96** C: r 🡪 **.974** D) r 🡪 **.99**