

# A correlation of precalculus pearson school

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## Understanding Pearson Correlation

### What is the Pearson Correlation Method?

The Pearson correlation method is a statistical technique used to measure the linear relationship between two variables. It calculates a correlation coefficient that quantifies the strength and direction of the association.

### How to Calculate Pearson Product Moment Correlation Coefficient?

The Pearson product moment correlation coefficient, denoted as  $r$ , is calculated as follows:

$$r = \frac{(\sum (x - \bar{x})(y - \bar{y}))}{\sqrt{(\sum (x - \bar{x})^2) (\sum (y - \bar{y})^2)}}$$

where:

- $x$  and  $y$  are the data values of the two variables
- $\bar{x}$  and  $\bar{y}$  are the means of  $x$  and  $y$ , respectively

### Copy and Paste Formula for Pearson Correlation

`=CORREL(x_range, y_range)`

Replace "x\_range" and "y\_range" with the cell ranges containing the data values for the two variables.

### What Does a Correlation of 0.85 Mean?

A correlation of 0.85 indicates a strong positive linear relationship between the two variables. The closer the correlation coefficient is to 1, the stronger the positive relationship. Conversely, the closer it is to -1, the stronger the negative relationship. A correlation of 0 indicates no linear relationship.

## How to Interpret a Pearson Correlation

- **Positive Correlation:** If  $r > 0$ , the two variables tend to increase or decrease together.
- **Negative Correlation:** If  $r < 0$ , the two variables tend to move in opposite directions.
- **No Correlation:** If  $r = 0$ , there is no linear relationship between the two variables.

## How to Write Up Pearson Correlation Results

When reporting Pearson correlation results, include the following:

- The value of the correlation coefficient ( $r$ )
- The number of data points ( $n$ )
- The significance level ( $p$ -value)
- A brief interpretation of the results

## How to Calculate Correlation?

To calculate correlation, you can use:

- Statistical software (e.g., SPSS, R)
- Excel or Google Sheets functions (e.g., CORREL, PEARSON)
- A calculator with statistical capabilities

## What is Correlation in Maths?

Correlation measures the linear relationship between two variables. It ranges from -1 to 1, where: \_\_\_\_\_

- -1 indicates a perfect negative correlation
- 0 indicates no correlation
- 1 indicates a perfect positive correlation

## How to Calculate Pearson's Correlation Coefficient Using a Calculator?

Enter the following data into your calculator:

- List 1: Data values for variable x
- List 2: Data values for variable y
- Select the "Statistics" or "Correlation" function
- Calculate the correlation coefficient (r)

## Why is Pearson R Correlation Used?

Pearson R correlation is used because it:

- Assumes a linear relationship between the variables.
- Is sensitive to outliers.
- Provides a standardized measure of the relationship that can be compared to other correlations.

## What is the Pearson Correlation Determination?

Pearson correlation determination, denoted as  $r^2$ , is the square of the Pearson correlation coefficient. It represents the percentage of variance in one variable that is explained by the other variable.

## When to Use Spearman vs Pearson?

- **Pearson:** Use when the relationship is expected to be linear and when the data is normally distributed.

- **Spearman:** Use when the relationship is not expected to be linear or when the data is non-parametric.

## Is Pearson Correlation R or r<sup>2</sup>?

Pearson correlation is represented by the letter  $r$ , which is the correlation coefficient.  $R^2$  represents the square of the correlation coefficient and is known as the correlation determination.

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