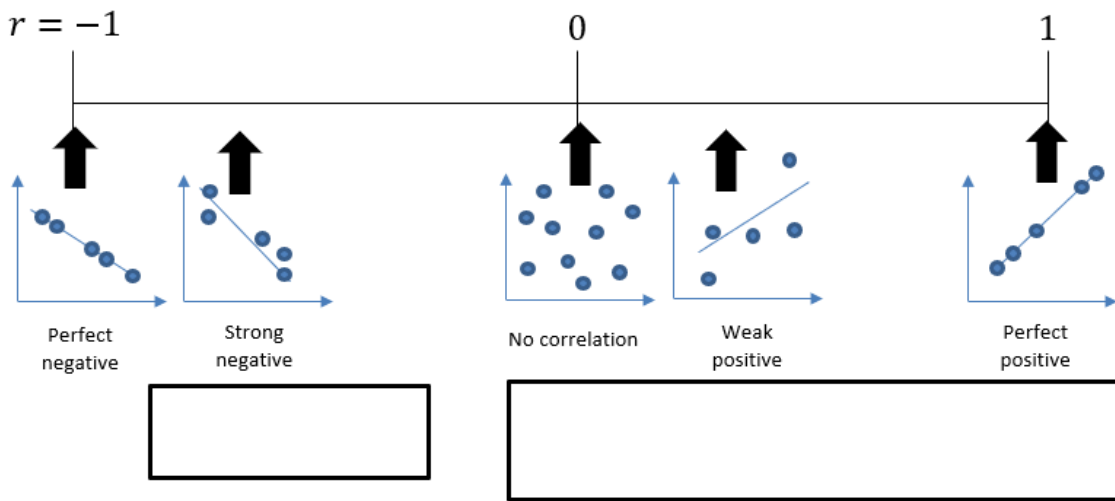


# Measuring Correlation

You're used to use qualitative terms such as "positive correlation" and "negative correlation" and "no correlation" to describe the **type** of correlation, and terms such as "perfect", "strong" and "weak" to describe the **strength**.

The **Product Moment Correlation Coefficient** is one way to quantify this:



## Calculating $r$ on your calculator

You must have a calculator that is capable of calculating  $r$  directly: in the A Level 2017+ syllabus you are no longer required to use formulae to calculate  $r$ .

$x$	$y$
1	3
2	6
3	5
4	8

6: Statistics

$y = a + bx$

Data Entry

PMCC

The following instructions are for the Casio ClassWiz. Press MODE then select 'Statistics'.

We want to measure **linear** correlation, so select  $y = a + bx$

Enter each of the  $x$  values in the table on the left, press = after each input. Use the arrow keys to get to the top of the  $y$  column.

While entering data, press OPTN then choose "Regression Calc" to obtain  $r$  (i.e. the coefficients of your line of best fit and the PMCC).  $a$  and  $b$  would give you the  $y$ -intercept and gradient of the regression line (but not required in this chapter).

Pressing AC allows you to construct a statistical calculation yourself. In OPTN, there is an additional 'Regression' menu allowing you to insert  $r$  into your calculation.

**You should obtain  $r = 0.868$**

# Example

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[Textbook] From the large data set, the daily mean windspeed,  $w$  knots, and the daily maximum gust,  $g$  knots, were recorded for the first 10 days in September in Hurn in 1987.

Day of month	1	2	3	4	5	6	7	8	9	10
$w$	4	4	8	7	12	12	3	4	7	10
$g$	13	12	19	23	33	37	10	n/a	n/a	23

- State the meaning of n/a in the table above.
- Calculate the product moment correlation coefficient for the remaining 8 days.
- With reference to your answer to part b, comment on the suitability of a linear regression model for these data.