Least Squares Regression

The Explanatory variable

is the one that you control and change in the 'experiment' (it usually comes first [x])

The Response variable

is the one that you measure after adapting the explanatory variable (it usually comes second [y])

The Equitation of the Least Squares Regression Line

$$y = a + bx$$

where a is the ***y-intercept*** and b is the ***gradient*** of the line

The value of the ***y-intercept*** (a) tells us the value of the variable y when the variable x has a value of 0
The value of the ***gradient*** (b) tells us the increase (or decrease if it is negative) in the variable y for every 1 increase in the variable x

The formulas for calculating the value of a and can be found in the formula booklet at the top of page 5:

Coefficients for least squares regression line:
least squares regression line of y on x is $y = a + bx$, where
$a = \bar{y} - b\bar{x}$

the regression coefficient of y on x is $b = \dfrac{S_{xy}}{S_{xx}} = \dfrac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2}$

YOU WILL NEVER BE ASKED TO PROVE OR CALCULATE THE VALUES OF a OR b WITH THESE FORMULAE FROM SCRATCH

You may however, need to substitute given values into the formula to find a value for y = a + bx

You do, however need to be able

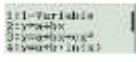
to calculate the value of a and b

from scratch using the calculator.

STEP 1: MENU

STEP 2: 6: Statistics

STEP 3: 2: y=a+bx



STEP 4: Input Data for x and y

STEP 5: AC

STEP 6: OPTN

STEP 7: 3: Regression Calc

a = the y-intercept value

b = the gradient value