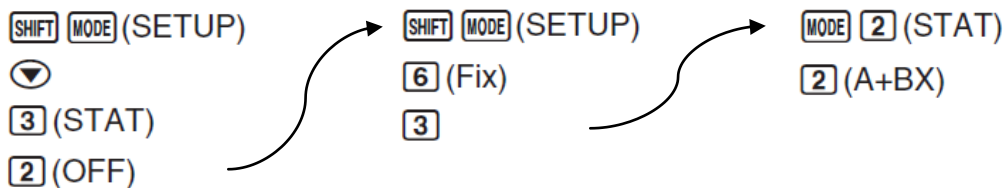


Calculating the Correlation Coefficient and the Equation of the Line of Best Fit, using a Casio fx-83GT-plus

(NB: An fx-ES calculator can be used if the alternative method in part 3 and part 4 is followed)

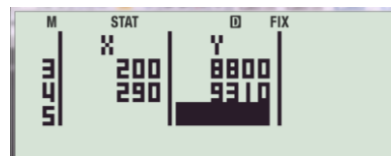
To calculate the linear regression and regression correlation coefficients for the following paired-variable data and determine the regression formula for the strongest correlation: $(x, y) = (20, 3150), (110, 7310), (200, 8800), (290, 9310)$. Specify Fix 3 (three decimal places) for results.

- Set up the calculator** to accept bi-variate statistical data (raw paired, not as a frequency table), with results to be displayed to 3 decimal places.



- Input the data set** $x=\{1,2,2,3,3,3,4,4,5\}$ as a frequency table

20 \equiv 110 \equiv 200 \equiv 290 \equiv
 ▼ ▶
 3150 \equiv 7310 \equiv 8800 \equiv 9310 \equiv



- Calculate the correlation coefficient.**

AC SHIFT 1 (STAT)
 5 (Reg)
 3 (r)
 \equiv

0.923

(If using an fx-ES calculator, select AC SHIFT 1 7 3 \equiv)

- Calculate the equation of the line of best fit** in form $y = A + Bx$

a. to find A

b. to find B

AC SHIFT 1 (STAT)
 5 (Reg)
 1 (A)
 \equiv

3703.222

AC SHIFT 1 (STAT)
 5 (Reg)
 2 (B)
 \equiv

22.189

(If using an fx-ES calculator, select AC SHIFT 1 7 1 \equiv and AC SHIFT 1 7 2 \equiv)

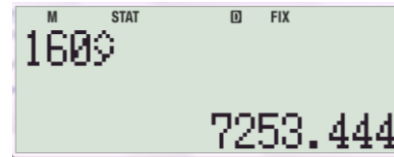
Results: Linear Regression Correlation Coefficient: 0.923
 Regression formula: $y = 3703.222 + 22.189x$

5. Calculate estimated values of y

Based on the regression formula (the line of best fit), an estimated value of y can be calculated for a given x -value.

To determine an estimated value for y when $x = 160$, select

AC 160
SHIFT **1** (STAT)
5 (Reg)
5 (\hat{y})
=



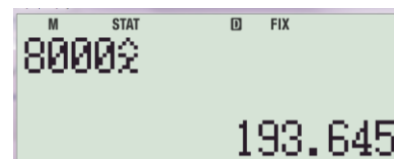
(If using an fx-ES calculator, select **AC** 160 **SHIFT** **1** **7** **5** **=**)

6. Calculate estimated values of x

A corresponding x -value can also be calculated for a value of y in the regression formula.

To determine an estimated value for x when $y = 8000$, select

AC 8000
SHIFT **1** (STAT)
5 (Reg)
4 (\hat{x})
=



(If using an fx-ES calculator, select **AC** 8000 **SHIFT** **1** **7** **4** **=**)

7. To enter in a new set of data, select **MODE** **2** **2** and enter data following step2 onwards.

8. To reset the calculator to COMP mode, select **MODE** **1** **SHIFT** **MODE** **8** **1**.