

## Module 5: Examples of functions from geometry

## Part A - Verifying non-linear relationships

In order to verify if a set of data between 2 or more points, use the STAT mode.

MODE 2 (STAT)

©COMP ⊠STAT BTABLE

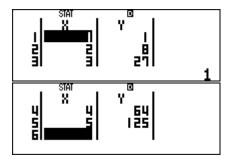
Once in this menu select linear form for an equation 2: A + BX.

**2** (2: A+BX)

1:1-VAR 2:A+BX 3:\_+cX2 4:1n X 5:0^X 6:A·B^X 7:A·X^B 8:1/X

Enter the points that you are checking. Enter the X coordinates in the X list and the Y coordinates in the Y list. Use the to enter the value and the arrow keys to navigate between lists. This data set is a power of 3.

X	Υ
1	1
2	8
3	27
4	64
5	125



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Press the **AC** key to clear the screen and select the r-value (correlation coefficient). The r value is in the STAT menu above the number 1.

SHFT 1 to get to the menu for the r-value. Finally press 3: r for the r-value.

3 =

1:Type 3:Sum 5:Reg	2:Data 4:Yar 6:MinMax
1:A 3:r 5:¢	2:B 4:%
r r	0
0.9431175138	

For a linear relationship the r value should be close to -1 or 1 with a value of -1 or 1 meaning a perfect fit. In above example to r-value is about 0.94, but the data suggests a power of 3. Test the r-value for a cubic relationship.

SHIFT 1 (STAT)

(1: Type) (7 (A\*X^B)

**AC** SHIFT **1** (STAT) **5** (5: Reg)

**3**(3: r)**≡** 

The r-value is 1, a perfect fit.

Note: Always graph your data set before looking at the r value.

1:Type 3:Sum 5:Reg	2:Data 4:Var 6:MinMax
1:1-VAR 3:_+CX2 5:6^X 7:A•X^B	4:ln X 6:A·B^X
	2:Data 4:Var 6:MinMax
1:A 3:r 5:9	2:B 4:%
r star	0
	1

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To verify that it is a cubic (3<sup>rd</sup> power function), press

**SHIFT 1** (STAT) **5** (5: Reg)

**2**(2: B)

1:Type 3:Sum 5:Reg	2:Data 4:Var 6:MinMax
1:A 3:r 5:0	2:B 4:%
SIAT B	0
	3