Cubes and Squares

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Student Activity

7 8 9 10 11 **12**

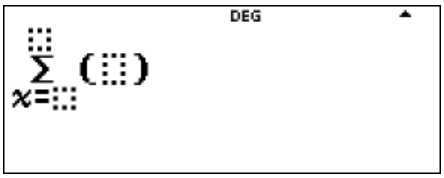
TI-30XPlus MathPrint™ | Activity | Student | 25 min

Calculator Instructions

The first part of this investigation involves summing cubed numbers: $1^3+2^3+3^3+\ldots x^3=\sum_{n=1}^{x} n^3$

The sum command can be found in the MATH menu.

E
math 5



To find the sum of the first 4 numbers cubed enter the numbers 1 and 4 accordingly:

A D
1 ▲ 4 ▶

The numbers need to be cubed **before** they are added.

clear var C
x^{yzt}_{abcd} $x^{\square}$ 3 ▶ ▶

Press enter to determine the result.

Question: 1.

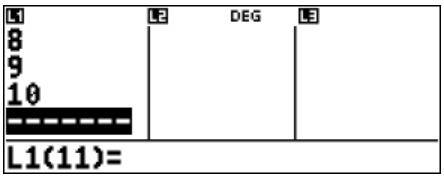
Determine the sum of the first 10 numbers cubed: $1^3 + 2^3 + 3^3 + \ldots 10^3$.

Question: 2.

Square the sum of the first 10 whole numbers and comment on the result: $(1+2+3+\ldots 10)^2=\left(\sum_{n=1}^{x} n\right)^2$

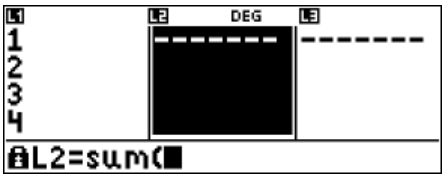
Enter the numbers 1 to 10 in List 1.

stat-reg/distr A B
data 1 enter 2 enter ...

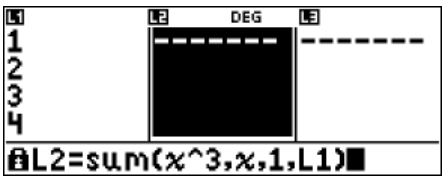


Author: P. Fox

Navigate across to List 2 and enter the sum formula:

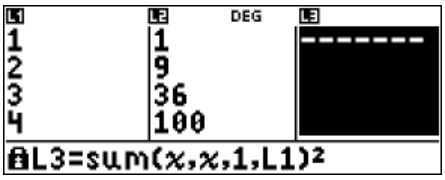


The syntax for the sum command in this environment is as follows: sum(*expression*, *variable*, *start*, *end*)



Then press: enter to execute the calculations.

List 3 needs to have a formula for the squared sum of whole numbers. The formula should entered as shown opposite:



Question: 3.

Complete the following table of values:

N	1	2	3	4	5	6	7	8	9	10
N^3	1	8	27							
$\sum_{x=1}^{n} x^3$	1	9	36							
$\sum_{x=1}^{n} x$	1	3	6	10						
$\left(\sum_{x=1}^{n} x\right)^2$	1	9								

Question: 4.

Write down the fomula for $\sum_{x=1}^{n} x$ and hence the formula for $\sum_{x=1}^{n} x^3$.

Question: 5.

Use induction to prove the formula for the sum of the first n^3 whole numbers.

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