8) Understanding the Problem

Construct a table using the data and examine th pattern to determine which method works best Then make a functional equation to determi the number of cubes in the 100th figure.

Devising A Plan

I am going to make a table, figure out the pattern, and then make an equation based on the pattern. Then I will be able to plug 100 in fo "n" to get the number of cubes in the 100th fig

Carrying out the Plan

1	2	3	4	5
1	4	7	10	13
	3	3	3	3

Key

Q_1 = The first term is 1

Q_n = The n^{th} term

Q_{n-1} = The term before

(A) The method of finite differences can be used becau there is a common difference and the data is expressed with a linear line on a graph. With this method we can infer that:

$Q_1 = 1$

$Q_n = Q_{n-1} + 3$ ← arithmetic sequence

(C) $Q_n = 3n - 2$ ← Functional equation

(B) $Q_n = 3(100) - 2$ → So, there are 298 cubes in the 100th figure

Looking Back

With the functional equation we can figure out that the 1,000th figure has 2998 cubes in it.