

Cantor: Assignment #2

One way to represent numbers is with *dot pictures*. Here are some different dot pictures for the number 10:

		OOO		
	OOO	OO	OOOOOOOO	OOO
OOOOO	OOO	OO	O	OOO
OOOOO	OOO	O	O	OO
	O	O	O	OO
		O		

The definition of the term *dot picture* requires exactly that there are as many dots as the given number, and each row has at least as many dots as the row immediately below it.

Let T be the set of dot pictures that represent the number 10 and have exactly three rows.

Let J be the set of ways to represent 10 as a sum of three positive integers. For example, here are some elements of the set J :

$$\begin{array}{l}
 10 = 5 + 3 + 2, \quad 10 = 8 + 1 + 1, \\
 10 = 4 + 3 + 3, \quad 10 = 6 + 3 + 1, \\
 10 = 6 + 2 + 2, \quad 10 = 7 + 2 + 1.
 \end{array}$$

Notice that for this task we consider two representations as being the same if all you do is reorder the numbers. So $10 = 5 + 3 + 2$ is the same thing as $10 = 2 + 3 + 5$ and also the same thing as $10 = 2 + 5 + 3$. Also, the representation $10 = 9 + 1 + 0$ is not an element of J because 0 is not a positive integer.

In one written page, describe a matching between the elements of T and the elements of J . Discuss why this means that these two sets have the same number of elements.

Specifications for Grading

To earn credit, this assignment must

- be typed, of no more than one page in length (diagrams may be hand-drawn);
- address the prompt above;
- conform to reasonable standards for grammar, spelling, and usage of the English language with minimal errors. (You may consider seeking help on writing from the Writing Center in the Academic Learning Center. <http://www.uni.edu/unialc/writing-center>);
- be turned in by 3pm on Friday, April 15.