

Starting Today

For the remainder of the term.

**Unless you are given specific permission to use the internet
or a particular website,
then **DO NOT USE THOSE RESOURCES!!!!****

**IF IN DOUBT, ASK BEFORE YOU USE
ANY OTHER RESOURCES!**

Feb 8: Number Study

Partitions, Sums of Squares

math partition



Web Apps

Examples

Random

Input interpretation:

partition

Open code

Basic definition:

A way of writing a whole number as a sum of positive integers in which the order of the addends is not significant.



Detailed definition:

[More details](#)

A partition is a way of writing an integer n as a sum of positive integers where the order of the addends is not significant, possibly subject to one or more additional constraints. By convention, partitions are normally written from largest to smallest addends, for example, $10 = 3 + 2 + 2 + 2 + 1$. All the partitions of a given positive integer n can be generated in the Wolfram Language using `IntegerPartitions[list]`. `PartitionQ[p]` in the Wolfram Language package `Combinatorica`` can be used to test if a list consists of positive integers and therefore is a valid partition.



Partitions by size:

size of partition	count	example
1	1	$10 = 10$
2	5	$7 + 3 = 10$
3	8	$6 + 2 + 2 = 10$
4	9	$4 + 3 + 2 + 1 = 10$
5	7	$2 + 2 + 2 + 2 + 2 = 10$
6	5	$3 + 3 + 1 + 1 + 1 + 1 = 10$
7	3	$4 + 1 + 1 + 1 + 1 + 1 + 1 = 10$
8	2	$3 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 10$
9	1	$2 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 10$
10	1	$1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = 10$

We are only interested in using summands that are square numbers!!!

$$\begin{aligned}4 + 4 + 1 + 1 &= 10 \\ 9 + 9 &= 18\end{aligned}$$

Explore MATHEMATICALLY!!

**DO NOT USE ANY RESOURCE OTHER THAN YOUR
MIND AND DISCUSSIONS WITH YOUR GROUP!!!**

***A computer should only be used to enter the details of
your work.***

DO NOT WRITE A COMPUTER PROGRAM.