

Project Euler #45: Triangular, pentagonal, and hexagonal

This problem is a programming version of [Problem 45](#) from [projecteuler.net](#)

Triangle, pentagonal, and hexagonal numbers are generated by the following formulae:

$$\begin{aligned} \text{Triangle } T_n &= n(n+1)/2 & 1, 3, 6, 10, 15, \dots \\ \text{Pentagonal } P_n &= n(3n-1)/2 & 1, 5, 12, 22, 35, \dots \\ \text{Hexagonal } H_n &= n(2n-1) & 1, 6, 15, 28, 45, \dots \end{aligned}$$

It can be verified that $T_{285} = P_{165} = H_{143} = 40755$

For this challenge you are given N , a , b , where $a < b$ and $a, b \in \{3, 5, 6\}$ where 3 represents triangular numbers, 5 represents pentagonal numbers and 6 is hexagonal. It can be observed that all hexagonal numbers are triangular numbers so we'll handle only 2 kinds of queries as $N \ 3 \ 5$, find all numbers below N which are Triangular number as well as Pentagonal $N \ 5 \ 6$, find all numbers below N which are Pentagonal number as well as Hexagonal

Input Format

Input contains three integers $N \ a \ b$

Output Format

Print the answer corresponding to the test case. Print numbers in ascending order.

Constraints

$2 \leq N \leq 2 \times 10^{14}$
 $a, b \in \{3, 5, 6\}$
 $a < b$

Sample Input #00

10000 3 5

Sample Output #00

1
210

Sample Input #01

100000 5 6

Sample Output #01

1
40755

