Many Convex Polygons

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Given the n vertices $P(0), P(1), \cdots, P(n-1)$ of a convex polygon in counter-clockwise order, there are $\binom{n}{k}$ ways to choose k vertices $P(i_0), P(i_1), \cdots, P(i_{k-1})$ $(0 \le i_0 < i_1 < \cdots < i_{k-1} < n)$. By connecting the selected vertices in counter-clockwise order (that is, for each $0 \le j < k$, connect vertices $P(i_j)$ and $P(i_{(j+1) \bmod k})$), a convex polygon with k vertices can be formed.

For each $3 \le k \le n$, consider all convex polygons with k vertices formed in the above manner. Calculate twice the sum of the areas of these convex polygons.

Input

There is only one test case in each test file.

The first line contains an integer n $(3 \le n \le 2 \times 10^5)$, indicating the number of vertices of the convex polygon.

For the following n lines, the i-th line contains two integers x_i and y_i $(-10^9 \le x_i, y_i \le 10^9)$, indicating the coordinates of the i-th vertex of the convex polygon. The vertices are given in counter-clockwise order, and no three vertices are collinear.

Output

Output $(n-2)$ lines, each containing one integer, where the i-th line is the answer to $k = i + 2$.

It can be proven that the answer is an integer. Since the answer may be large, output the answer modulo 998 244 353.

Example

standard input	standard output
6 0 0 1 0 2 1 2 2 1 2 0 1	36 54 30 6