Points

SEASON 8 – SIXTH ROUND

You are given a set of **N** points in a 2D plane. No three points are collinear and all coordinates are integers.

Let's consider all quadrilateral with vertices some of these **N** points. We will consider **both convex and concave** quadrilaterals. Find the largest area of one of these figures.

Write a program **points**, that calculates the **largest possible area** of a quadrilateral with vertices and prints this value **multiplied by 2.**

Input

The first line of the input file points.in contains the integer **N** – the number of points. The next **N** lines contain the coordinates of the points – **x[1], y[1], x[2], y[2], ... , x[N], y[N]**.

Output

The output file points.out must contain the largest possible area **multiplied by 2**. It is guaranteed that this number will also be an integer.

Constraints
4 ≤ N ≤ 2000
-10⁹ ≤ x[i], y[i] ≤ 10⁹

Time limit: 2 sec
Memory limit: 256 MB

Example test

Input (points.in)	Output (points.out)
5 2 7 9 9 1 6 4 6 2 4	24