

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

$$4 \leq N \leq 2000$$

$$-10^9 \leq x[i], y[i] \leq 10^9$$

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