Problem A. Final Exam

Input file:	*standard input*
Output file:	*standard output*
Time limit:	12 seconds
Memory limit:	256 mebibytes

Rikka is a talented student.

She spends almost every day on ICPC. But the final exam is approaching.

Rikka plans to grasp- the last minute to review the courses before the exam. She has up to M minutes for review and then takes n consecutive exams. If Rikka spends x minutes on the review for the i-th exam, she would get $f_i(x)$ points, where $f_i(x) = \max\{0, \min\{d_i, a_i x^2 + b_i x + c_i\}\}$ with the exam-specific parameters a_i, b_i, c_i, d_i.

Rikka wants to maximize the total score of her n exams. Note the minutes she spends in reviewing a certain course can be any non-negative real number. Also, she does not have to spend all of her M minutes on the review so that she can spend more time on ICPC.

Input

The first line contains an integer n and a real number M.

Each of the following n lines contains four real numbers a_i, b_i, c_i, d_i, denoting the parameters of all the n exams.

It is guaranteed that $1 \le n \le 100\,000$, $0 < M \le 10^8$, $|a_i| \le 10$, $|b_i| \le 5000$, $0 \le c_i \le d_i \le 5000$, and all real numbers in the input are given with exactly three decimal places.

It is guaranteed that there are at most 18 exams with $a_i > 0$.

Output

You need to output d, the maximum total score that Rikka can get. Assuming the correct result is d^*, you need to ensure that $\frac{|d-d^*|}{\max\{d^*,1\}} \le 10^{-6}$.

Example

standard input	standard output
4 2.000 0.000 7.000 3.000 10.000 -1.000 10.000 3.000 10.000 -2.000 10.000 3.000 10.000 -3.000 10.000 3.000 10.000	29.5734198185