Problem I. PLAYERUNKNOWN'S BATTLEGROUNDS

Input file: standard input
Output file: standard output

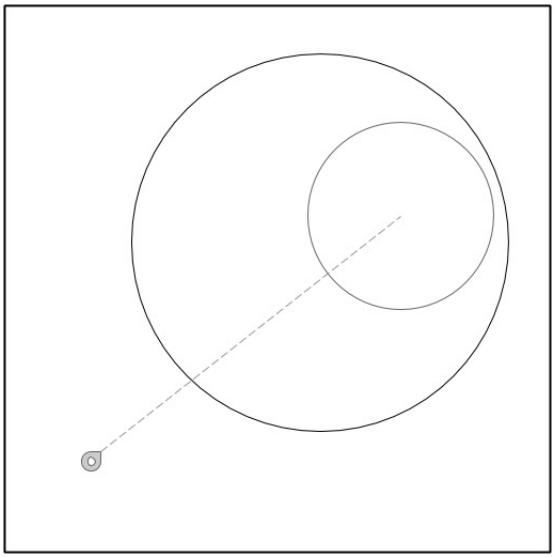
PLAYERUNKNOWN'S BATTLEGROUNDS (PUBG, also known as "Chicken Dinner") is the most popular survival shooter game in recent months. Players are dropped into a wide, open area, and they must fight with each other until the last person survives. Specifically, there is a shrinking circle called safe area in the battlefield, while players outside this area will suffer continued damage, which forces them to confront each other and creates chances of skirmish.

Some players are particularly stupid, so they became users of the WG company. But recently, WG company often receive complaints from users that they often die outside the safe area. After carefully study, WG company found that their users are too stupid to know how to run into the safe area. Therefore, they decided to assist their users to complete this action.

After creating a coordinate system on the map, the player is at (x_0, y_0) point at moment 0, with movement speed v. At this moment, there is a circle C_1 with radius of r_1 and center at (x_1, y_1) indicating the safe area now. And players outside the safe area will get d_1 continued damage per unit of time. The safe area will start to shrink at time t_1 and becomes a smaller circle C_2 at time t_2, whose center is (x_2, y_2) and has radius r_2. Since then, players outside the safe area will get d_2 damage per unit of time.

C_2 is strictly in C_1, and the change of circle radius and the movement of circle center are at a constant speed. However, damages outside the safe area will change from d_1 to d_2 instantly at t_2.

Your mission is to calculate the minimum damage the player incurs from the moment 0 till he/she reaches the final safe area C_2 if the player moves optimally.



Input

The first line of the input gives the number of test cases, T. T test cases follow.

Each test case contains three lines. The first line contains three integers x_0, y_0 and v, indicating the initial position and moving speed of player. The second line contains five integers x_1, y_1, r_1, d_1 and t_1, while the third line also contains five integers x_2, y_2, r_2, d_2 and t_2, as described above respectively.

Output

For each test case, output one line containing "`Case #x: y`", where `x` is the test case number (starting from 1) and `y` is the minimum damages.

`y` will be considered correct if it is within an absolute or relative error of 10^{-4} of the correct answer.

Limits

- $1 \leq T \leq 100$.
- $0 \leq x_0 \leq 80000$.
- $0 \leq y_0 \leq 80000$.
- $50 \leq v \leq 400$.
- Every point(x, y) on C_1 has $0 \leq x \leq 80000$ and $0 \leq y \leq 80000$.
- C_2 is strictly in C_1.
- $1 \leq d1 \leq d2 \leq 11$.
- $0 \leq t1 \leq t2 \leq 80000$.

Example

standard input	standard output
3 700 100 50 600 600 600 5 0 800 400 200 10 2 700 0 80 600 600 600 5 0 800 400 200 10 2 100 100 150 600 600 600 5 1 800 800 200 10 4	Case #1: 4.2537599506 Case #2: 16.5388203202 Case #3: 28.4702942694