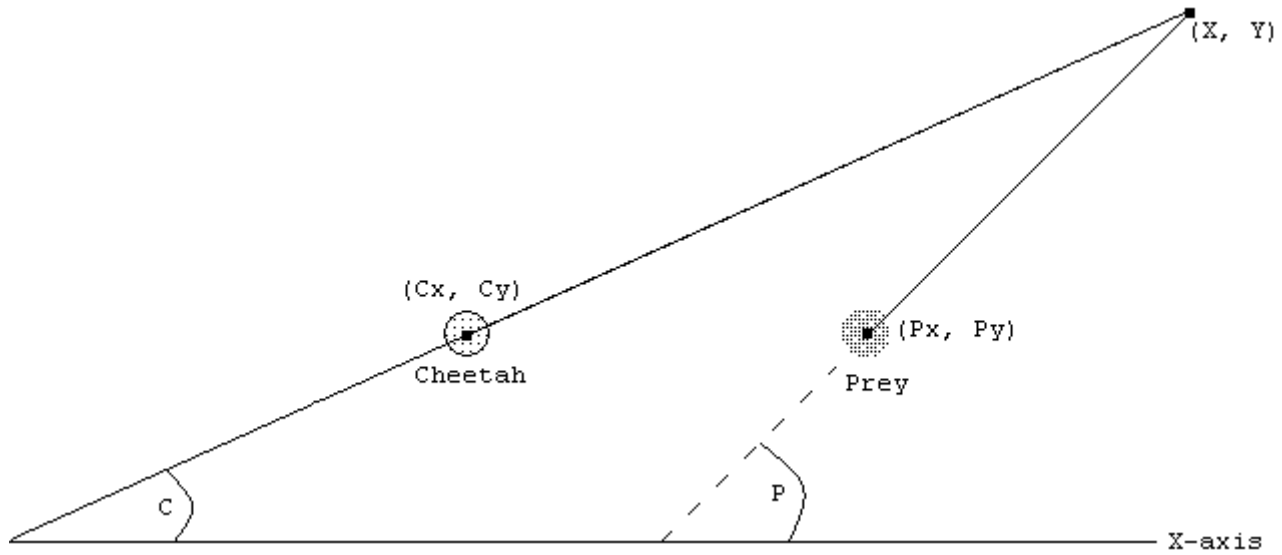# 10708   Cheetah

The cheetah is a beautiful hunting animal. Although it can gain incredible speed, it tires soon and so cannot maintain the speed for long. So in an attempt to catch a prey, the cheetah must choose a path of minimum length.

The cheetah quietly and discreetly closes in on the prey. When the cheetah is at position (C_x, C_y) and the prey at position (P_x, P_y), the prey realizes that the cheetah is close by and starts running with the constant speed of U feet per second at an angle P with the positive direction of X-axis. The cheetah also starts running at a constant speed of V feet per second at an angle C to ensure that he can catch the prey with minimum effort. The cheetah, however, cannot maintain the speed for more than L seconds.

Provided the values of C_x, C_y, P_x, P_y, P, U, V, L, you have to find C, T, X, Y, where T is the time required for the cheetah to catch the prey and (X, Y) is the position at which the cheetah catches the prey.

The co-ordinates are in feet and range between $[0, 10000]$. The angles are in degrees and range between $[0, 360]$. The velocities range between $[0, 500]$. L ranges between $[0, 10000]$.

Input

The first line gives the number of test cases.

Each of the test case consists of a line containing 8 integers giving the values of C_x, C_y, P_x, P_y, P, U, V, L in that order.

Output

For each test case, if the cheetah can catch the prey, then print the values of C, T, X, Y in that order. Each value should have 2-digits after the decimal point. If the cheetah cannot catch the prey within L seconds, then print 'sorry, buddy'.

Sample Input

```
2
0 0 6 0 135 1 1 10
0 0 6 0 135 1 1 3
```

Sample Output

```
45.00 4.24 3.00 3.00
sorry, buddy
```