You are going from Dhaka to Chittagong by train and you came to know one of your old friends is going from city Chittagong to Sylhet. You also know that both the trains will have a stoppage at junction Akhaura at almost same time. You wanted to see your friend there. But the system of the country is not that good. The times of reaching to Akhaura for both trains are not fixed. In fact your train can reach in any time within the interval $[t_1, t_2]$ with equal probability. The other one will reach in any time within the interval $[s1, s2]$ with equal probability. Each of the trains will stop for w minutes after reaching the junction. You can only see your friend, if in some time both of the trains is present in the station. Find the probability that you can see your friend.

Input

The first line of input will denote the number of cases T ($T < 500$). Each of the following T line will contain 5 integers t_1, t_2, s_1, s_2, w ($360 \leq t_1 < t_2 < 1080$, $360 \leq s_1 < s_2 < 1080$ and $1 \leq w \leq 90$). All inputs t_1, t_2, s_1, s_2 and w are given in minutes and t_1, t_2, s_1, s_2 are minutes since midnight 00:00.

Output

For each test case print one line of output in the format '`Case #`k`:` p' Here k is the case number and p is the probability of seeing your friend. Up to $1e-6$ error in your output will be acceptable.

Sample Input

```
2
1000 1040 1000 1040 20
720 750 730 760 16
```

Sample Output

```
Case #1: 0.75000000
Case #2: 0.67111111
```