

Hard Launching

Felix, the cat, decided to play in the afternoon with some melons, he built a “melon launcher” and started pointing to targets. Soon he noticed that the melons sometimes overflies the victims or don't even get close to them.

The melon launcher can be rotated so it can shoot from an angle from 0 to 45 degrees.

Felix isn't good at maths, so he ask you to code a program that, given the target (in meters) distance and the speed (in meters / sec) you can give him the perfect angle for the melon launcher.

The gravity to be considered is of 9.806 meters / sec²

PI value to be considered is $2 * \text{acos}(0.0)$.

Input

The first line of input will contain an integer T denoting the T test cases, then, T cases will follow. Each of the following line will contain two integer numbers Ta and Sp, denoting the distance of the target and the speed of the melon respectively.

Output

Output the string “Scenario #i: “ where i is the test case you are analyzing followed by a single number D, denoting the Degrees necessary to do the launch, if the launching can't be done, output D as -1. the number must have a precision of 2 decimal digits.

Example

Input:

```
3
10 10
10 9
8 9
```

Output:

```
Scenario #1: 39.35
Scenario #2: -1
Scenario #3: 37.79
```

Constraints

$0 < Ta, Sp < 10000$