A: Polar Bear?

There is a classic riddle about a hunter leaving his camp and heading south a mile, then east a mile, and finally north a mile. At that point he is back at his camp and notices a bear tearing apart the tent. He shoots the bear. What color was the bear? The answer is *white* because the hunter must have set up camp at the north pole.

Interestingly, there are many other places on the earth that the hunter may have pitched camp and made a similar trip to return to the camp, though any bears would not have to be white. You will be given some locations and distances traveled south, east, then north. From this you are to determine if the hunter does indeed return to his camp.

Input

The first line of input will provide the number of camp sites to consider. Each following line will describe a camp site. The description includes a distance in kilometers from 0 to 45,000. This is the distance traveled on the south and north legs. Then there is a second distance in kilometers from 0 to 45,000. This is the distance traveled on the east leg. Finally there is the latitude, measured in degrees from -90 (south pole) to 90 (north pole). You may assume that the radius of the earth is 6378.1 kilometers. Allow 2 digits precision for all input values.

Output

For each proposed camp site display the case number followed by either *yes* if the hunter returns to within 0.1 kilometers of the camp, *no* if the hunter ends up farther than 0.1 kilometers from the camp, or *impossible* if it is not possible to travel that far south.

Sample Input

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3
10 20 90
45000 45000 90
1 1 85
```

Sample Output

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Case 1: yes
Case 2: impossible
Case 3: no
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