ASTU ICPC Club
Bullet Blitz

The Problem

Your Robocode tank is battling a formidable new opponent: CardinalBot! It is so named because of its unique movement pattern – it can only move in the cardinal directions (north, south, east, and west) and can't move in any in-between directions. Luckily your tank is equipped with an intelligent firing algorithm and can predict where CardinalBot will move to once it has been scanned on radar. While your firing algorithm is top notch, your weapon is unfortunately lacking. If any bullet travels a distance of more than 13 squares, it will explode instead of hitting its target, keeping you from scoring any points.

The Input

The beginning of the input file will consist of a single integer *n* representing the number of shots you fired against CardinalBot. The next *n* lines each contain 4 integers. The first two integers are *x1* and *y1*, the x and y coordinates for your tank's position. The second two integers are *x2* and *y2*, the x and y coordinates for the point at which your bullet should hit the enemy tank.

The Output

For every set of positions you process, you must calculate distance that your bullet traveled. You must also determine whether or not the bullet will actually hit CardinalBot at the intended position. Your output to the screen should contain the following information:

1) Your tank's initial position
2) The point at which your bullet is supposed to hit CardinalBot
3) Whether or not the bullet actually reached its destination.

Each item should be outputted on a line by itself with the following four formats:

```
Bullet shot from (x1, y1).
Bullet should hit CardinalBot at (x2, y2).
The bullet hits its target.
```
or
```
The bullet explodes.
```

For the last line, choose the appropriate format depending on whether or not the bullet hits its target. (x1, y1) should represent your tank's coordinates, (x2, y2) should represent the CardinalBot's coordinates, and Z should represent the distance between the two bots, printed as a regular double. Don't worry about the exact precision of this distance.

Separate the output for each case with a blank line.

Sample Input

```
2
1 3 5 7
1 1 20 20
```

Sample Output

```
Bullet shot from (1, 3).
Bullet should hit CardinalBot at (5, 7).
The bullet hits its target.

Bullet shot from (1, 1).
Bullet should hit CardinalBot at (20, 20).
The bullet explodes.
```