

Problem C - Coordinated motions

The population of PokeCity is crazy for PokeCity's latest product: the PoGo++ watch! The PoGo watch improves the grind of catching pokemon by automatically contacting Team Rocket to catch nearby pokemon for you. The product is so popular that PokeCity's delivery company, Viridian, is swamped with orders for PoGo++. To fulfill all the delivery orders, Viridian has replaced the human workers in their warehouses with two robots. In order to make use of the robots, Viridian must first come up with an algorithm to move the robots around their warehouse. This is where you come in!

Viridian's warehouse can be modelled as an infinite 2D space, where the robots can move freely around without obstacles. The two robots, A and B , are each shaped like a unit square. Robot A wants to move to a target location A' , and robot B wants to move to a target location B' . Due to the cheap construction of the two robots, they can only move in axis-aligned directions to get to their destinations. The only restriction is that while they are moving, the two robots cannot intersect (but can touch). What is the minimum total distance they must travel for A to get to A' and B to get to B' ?

Input

The first line will contain an integer T , denoting the number of test cases. Each of the following T lines contain 8 signed 32-bit integers, $A_x, A_y, B_x, B_y, A'_x, A'_y, B'_x, B'_y$, representing the cartesian coordinates of the lower left corner on A, B, A' and B' .

Output

The minimum total distance required, as an integer.

Sample Input

```
1
-1 -1 0 0 1 1 2 2
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Sample Output

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8
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