```cpp
#include "../bits/stdc++.h"
// N 頂点の最近点対距離を O(NlogN) で求める
// verified: http://judge.u-aizu.ac.jp/onlinejudge/review.jsp?rid=3380540
using ld = long double;
using P = std::pair<ld, ld>;
const ld INF = 1e15;

constexpr int MAX_N = 100000;
int N;
P A[MAX_N];

bool compareY(P a, P b)
{
    return a.second < b.second;
}

ld closestPair(P *a, int n)
{
    if (n <= 1)
        return INF;
    int m = n / 2;
    ld x = a[m].first;
    ld d = std::min(closestPair(a, m), closestPair(a + m, n - m));
    std::inplace_merge(a, a + m, a + n, compareY);
    // a は y の昇順

    std::vector<P> b;
    for (int i = 0; i < n; i++)
    {
        if (fabs(a[i].first - x) >= d)
            continue;

        for (int j = 0; j < int(b.size()); j++)
        {
            ld dx = a[i].first - b[int(b.size()) - j - 1].first;
            ld dy = a[i].second - b[int(b.size()) - j - 1].second;
            if (dy >= d)
                break;
            d = std::min(d, sqrt(dx * dx + dy * dy));
        }
        b.push_back(a[i]);
    }
    return d;
}

```