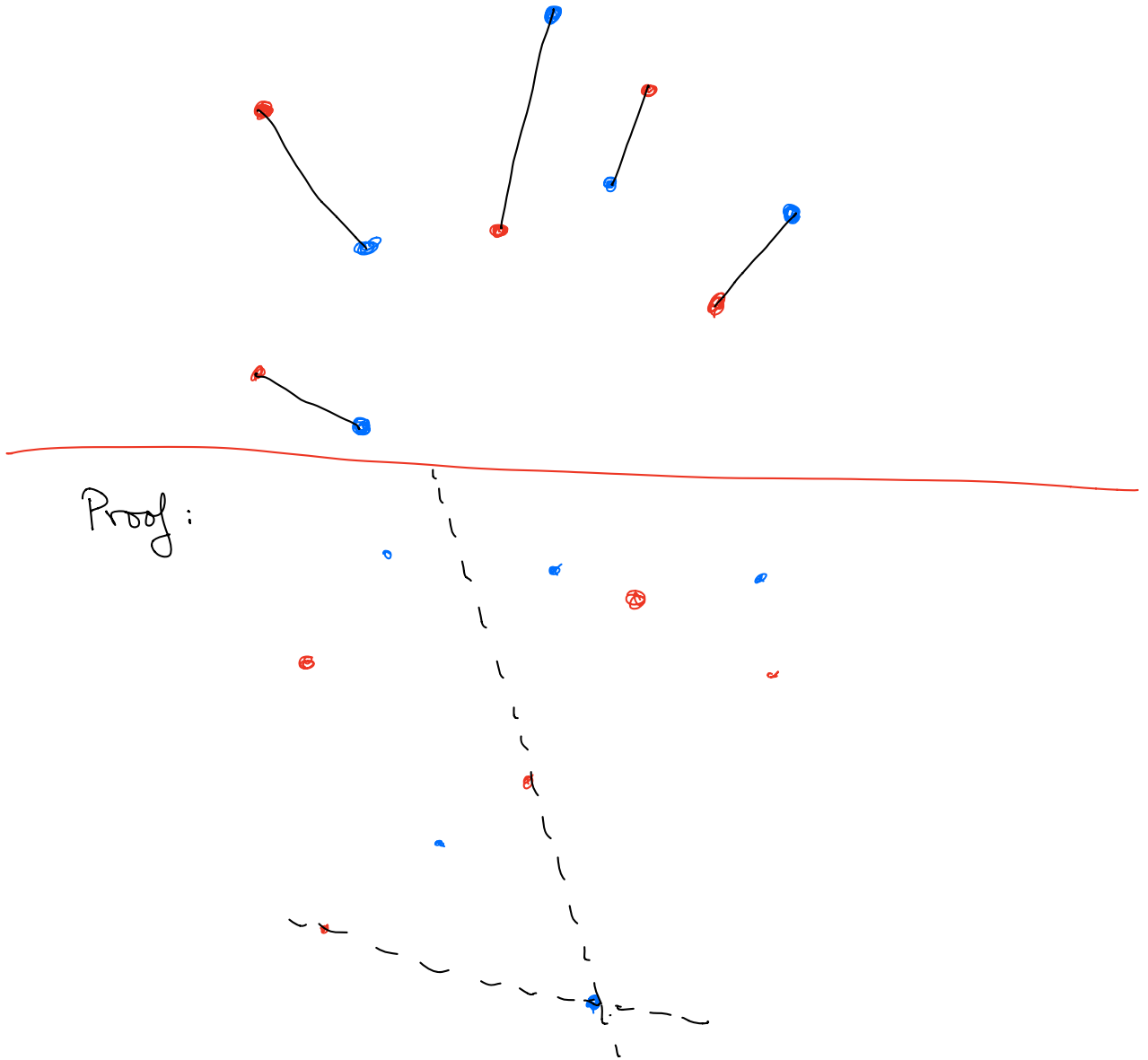
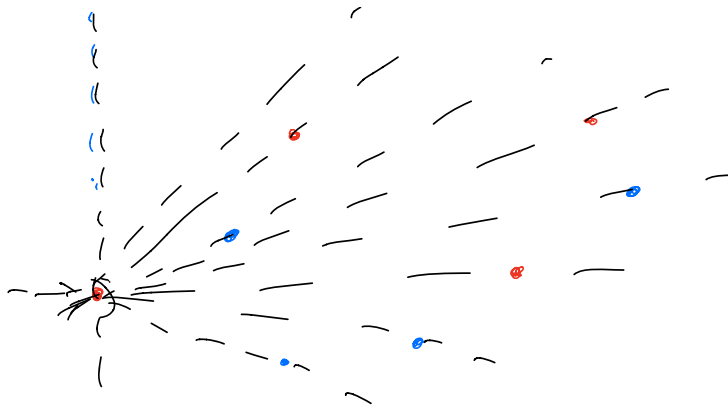


An example of strong induction

Proposition: Suppose that n red dots and n blue dots are arranged in the plane so that no three dots lie on a single line. Then you can draw n line segments, each connecting one red dot to one blue dot, in such a way that no two line segments intersect.

Proof: with thanks to John Stevens, and his answer to Puzzling Stack Exchange question number 16643, for the problem and the idea of the proof.





R ✓
 B ✓
 R ✓
 B
 R ✓
 B
 B²
 4 Blues
 3 Reds

Start with point with the smallest x coordinate, and then as low down as possible

Assume the starting pt is red.

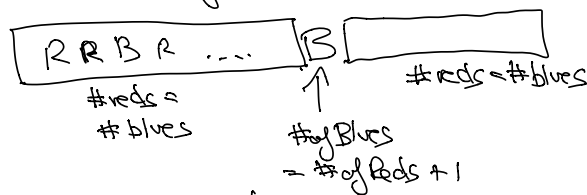
We get a sequence of Red, Blue

There are n red pts and n blue pts to begin

But we find one red pt as our base pt

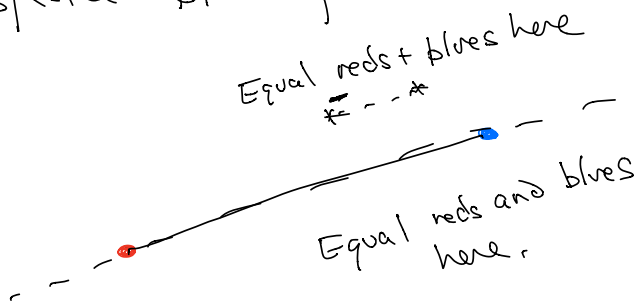
our sequence has n-1 R's and n B's.

At some pt in the list you reach a B where that Blue gives are more B than red.



n-1 reds
 n blues

Draw line from ^{red} base pt to this special blue point.



Apply strong inductive hypothesis to solve the problem on each side.

together with the line segment joining the base point

and respect
you have a solution.