Consider all configurations of n nonattacking rooks on an $n \times n$ board up to dihedral action.

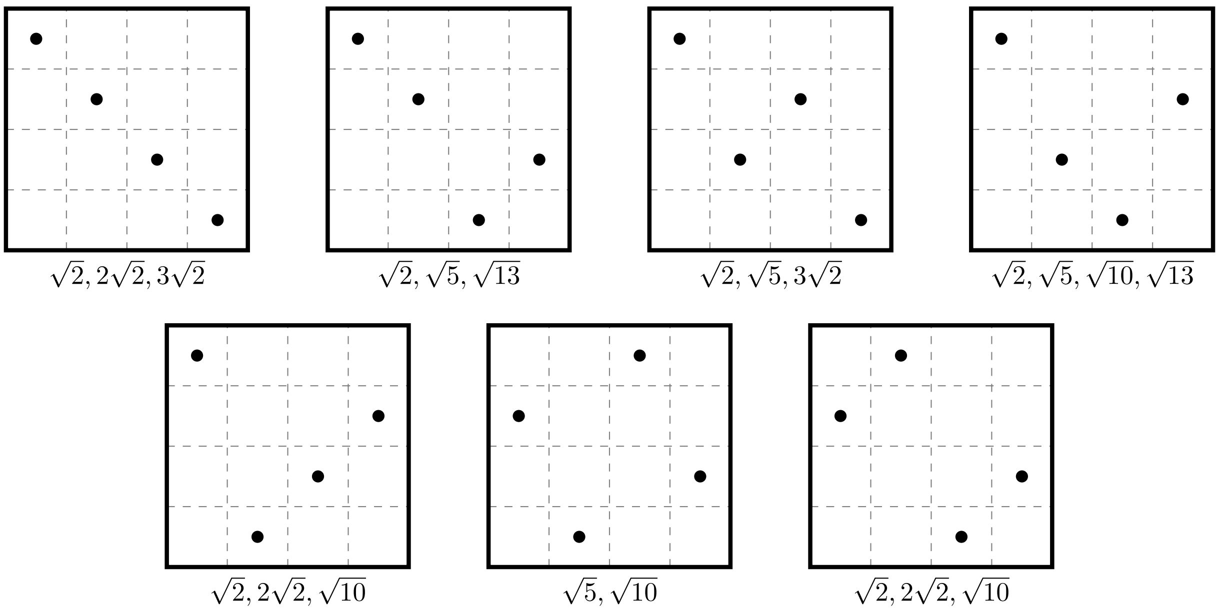

Figure 1: Each figure is marked with the distinct distances between pieces.

Question. What is the minimum number of distinct distances on such a figure?

Related.

1. What is the minimum number of distinct directions on such a figure? (Directions up to dihedral action?)
2. What if this is done with n queens instead of rooks?
3. What if this is done with $0 \leq k \leq n^2$ pieces, any of which are allowed to be in attacking positions?
4. What if distance is measured by the taxicab metric? d_3? d_∞? Number of knight-moves away? Number of king moves away?
5. How many configurations of nonattacking rooks on the torus, rectangle, triangluar grid, and other geometries?
6. Are any configurations of nonattacking rooks on the torus that can be meaningfully called a "generalized Costas array"?

References.

`https://en.wikipedia.org/wiki/Costas_array`

The maximum and minimum number of distinct distances is given by A320448 and A319476 respectively.

The number of extremal boards is given by A320573 and A320575 (A320574 and A320576, up to symmetry).