

Consider ways to place colored markers on an $n \times m$ grid so that no two pairs of markers of the same color have the same distance between them.

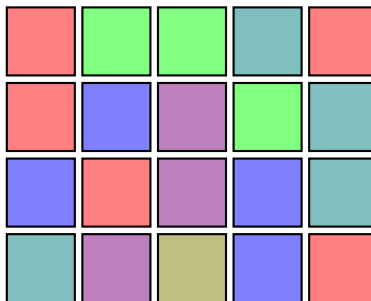


Figure 1: There are 5 markers and $5(5-1)/2 = 10$ distinct distances between red tiles. (There is no way to place 6 tiles.) Placing another red marker would result in two pairs of red markers being the same distance apart.

Question. How many figures can be made with n fingers and a rubber band?

Related.

1. How many colors of markers are required to fill the grid?
2. What if this is done on the d_1 , d_∞ , or d_3 metric?
3. What if this is done on a triangular or hexagonal grid?
4. What is the smallest board that can contain k markers?

Note. $c_{n \times m}(c_{n \times m} - 1)/2 \leq A301853(n, m) - 1$.

References.

Problem 34.

<https://oeis.org/A301853>