

## COLORED PARTITIONS OF A CONVEX POLYGON BY NON-INTERSECTING DIAGONALS

ABSTRACT. For integers  $a, b$  and  $n > 0$  we enumerate the total number of colored partitions of a convex polygon (with  $an + (b - 1)d + b + 1$  sides) by  $d$  non-intersecting diagonals into convex polygons with  $ak + b + 1$  sides as  $d$  runs from 0 to  $n - 1$ . We prove a recurrence relation and give a representation in terms of partial Bell polynomials that unifies several known results and simplifies the handling of different colorings. We give explicit examples and show how the counting changes as we vary  $a$  and  $b$  as well as the number of colors.