

Chapter 9

Counting Crossing-free Configurations

Exercise 9.1 For m a non-negative integer, show that the number of crossing-free perfect matchings for any set of $2m$ points in convex position is the m^{th} Catalan number, $C_m := \frac{1}{m+1} \binom{2m}{m}$.

Exercise 9.2 The number of triangulations of a convex n -gon satisfies the recurrence relation $P_{n+1} = \frac{4n-6}{n}P_n$ and $P_2 = 1$. Show that this implies $P_{n+2} = \frac{1}{n+1} \binom{2n}{n}$.