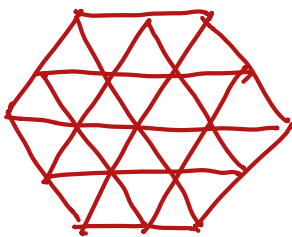


S15 Exam 2 Problem (5)



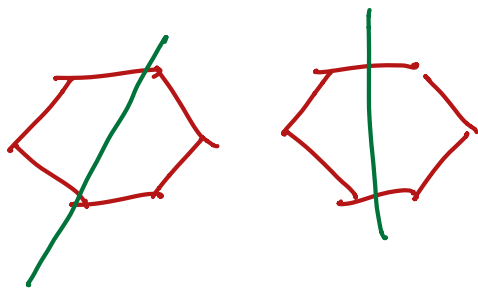
Mark 6 triangles out of 24

$$\frac{1}{24} \sum_{g \in G} |X_g|$$

Rotations and flips

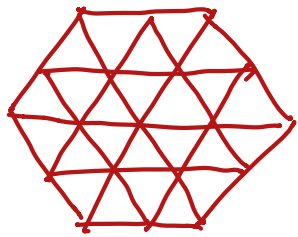
6 rotations 0, 1, 2, 3, 4, 5 / 6th turn
 ||
 identity

6 flips



$$\frac{1}{12} \left[\binom{24}{6} + \binom{12}{3} + 2 \binom{6}{2} + 2 \binom{4}{1} + 3 \binom{12}{3} \right]$$

1 identity
0

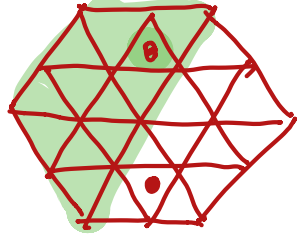


$$\binom{24}{0}$$

$$\frac{\cancel{24} \cdot \cancel{23} \cdot \cancel{22} \cdot \cancel{21} \cdot \cancel{20} \cdot \cancel{19}}{\cancel{6} \cdot \cancel{5} \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1}}$$

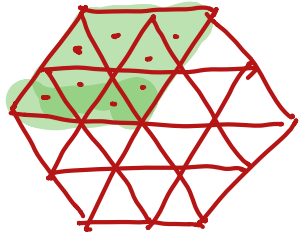
(1 7 4)

1 $\frac{3}{6}$



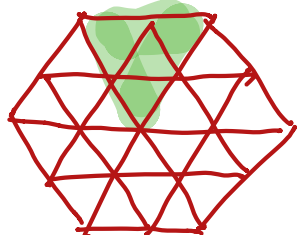
$$\binom{12}{3}$$

2 $\frac{2 \cdot 4}{6}$



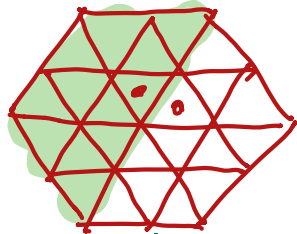
$$\binom{8}{2}$$

2 $\frac{1 \cdot 5}{6}$



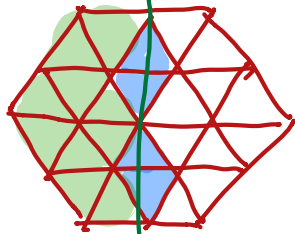
$$\binom{4}{1}$$

3



$$\binom{12}{3}$$

3



$$\binom{10}{3} + \binom{4}{2} \binom{10}{2} + \binom{10}{1}$$

$$\binom{4}{0} \binom{10}{3} + \binom{4}{2} \binom{10}{2} + \binom{4}{4} \binom{10}{1}$$

12

① like even, odd permutations half: half

$$S_4 \quad 12 + 12$$

even odd

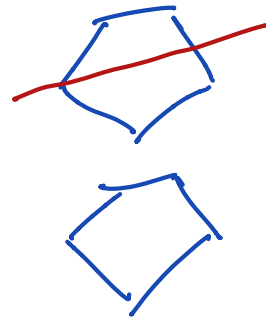
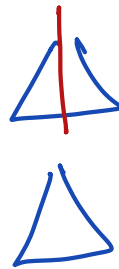
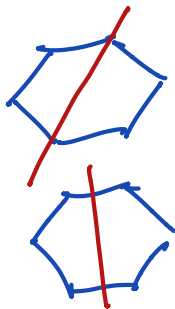
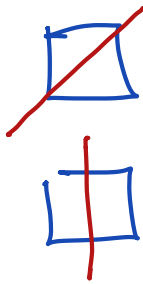
rotations and flips \Rightarrow also half & half

6 rotations \Rightarrow must be 6 flips

n-gon

n even

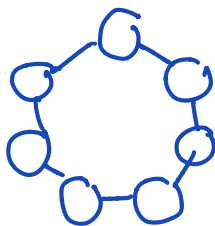
n odd



S16 [5] 7 bead necklace 3 colors

Exam 2

1 id



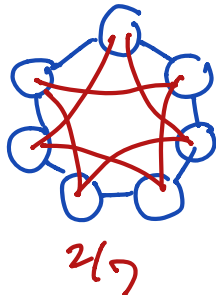
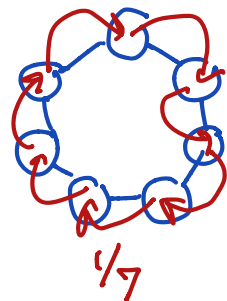
k colors

$$k^7$$

k	$\frac{1}{7}(k^7 + 6k)$
1	1
2	20
3	315

6

some other twin



k

three colors properties A, B, C

A = don't use first color

B = ... 2nd

C = ... 3rd

$$\emptyset - A - B - C + AB + AC + BC - ABC$$

$$315 - 20 - 20 - 20 + 1 + 1 + 1$$

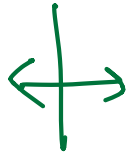
			0
0			

$\begin{pmatrix} 0 & 0 \\ 0 & 3 \end{pmatrix}$

			0
0			



			0
0			



			0
0			

