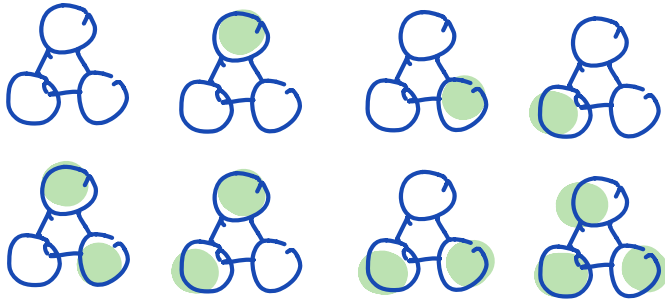
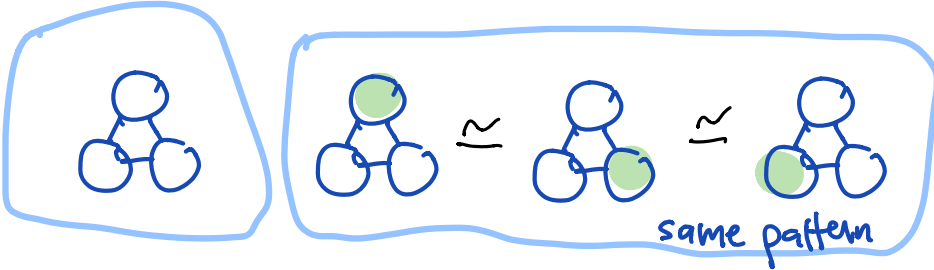


Up to symmetry.

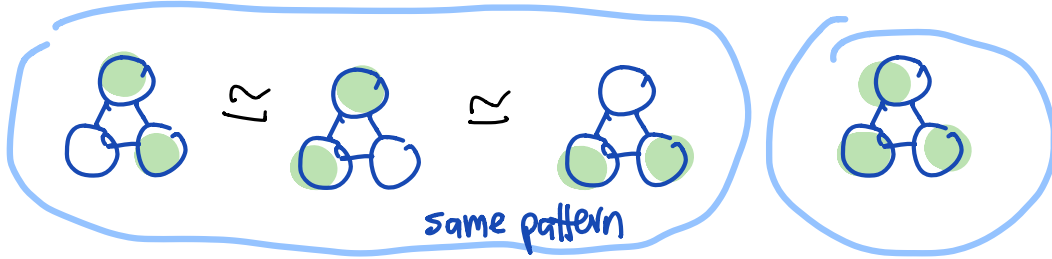
$G = \{ \underline{1}, \underline{2}, \underline{3} \}$ 3rd turns
group of symmetries



$X = \{ \text{all row possibilities} \}$

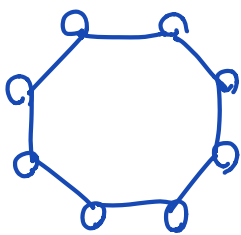


$M = \{ \text{All patterns up to symmetry} \}$



HW#2 S16

up to rotation 4 red, 4 blue.



$G = \{ 0, 1, 2, 3, 4, 5, 6, 7 \}$

identity



how many 8th turns?

+ mod 8

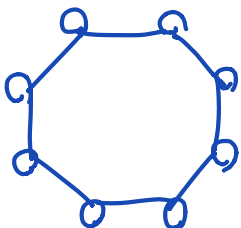
$$\frac{1}{|G|} \sum_{g \in G} |X_g|$$

choose 4 red, make rest blue

$g \in G$

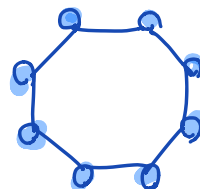
~~8~~
~~7~~
~~6~~
~~5~~
~~4~~
~~3~~
~~2~~
~~1~~

1 



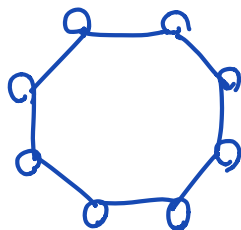
$\binom{8}{4} = 70$

0



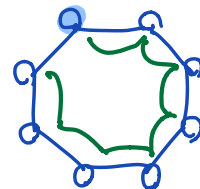
$\binom{8}{4} = 70$

4 1, 3, 5, 7



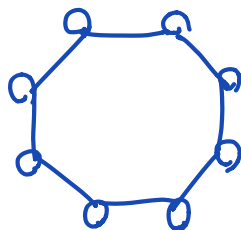
0

1



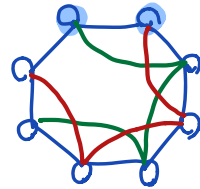
0

2 2, 6



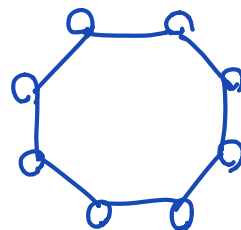
2

2



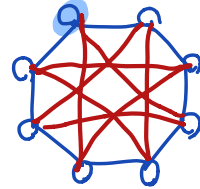
2

1 4



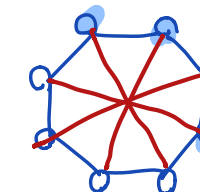
$\binom{4}{2} = 6$

3



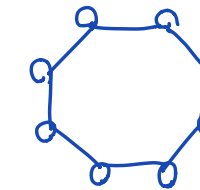
0

4



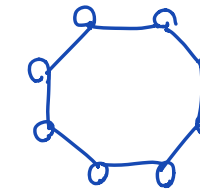
$\binom{4}{2} = 6$

5



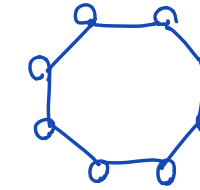
same as 3, 1

6



same as 2

7



same as 1

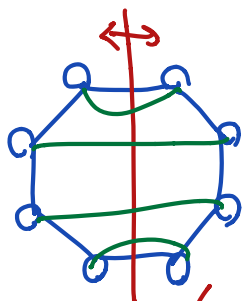
$$\frac{1}{8}(70 + 2 \cdot 2 + 6) = 10$$

with flips, $|G| = 6$

4



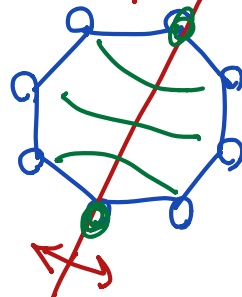
$$\binom{4}{2} = 6$$



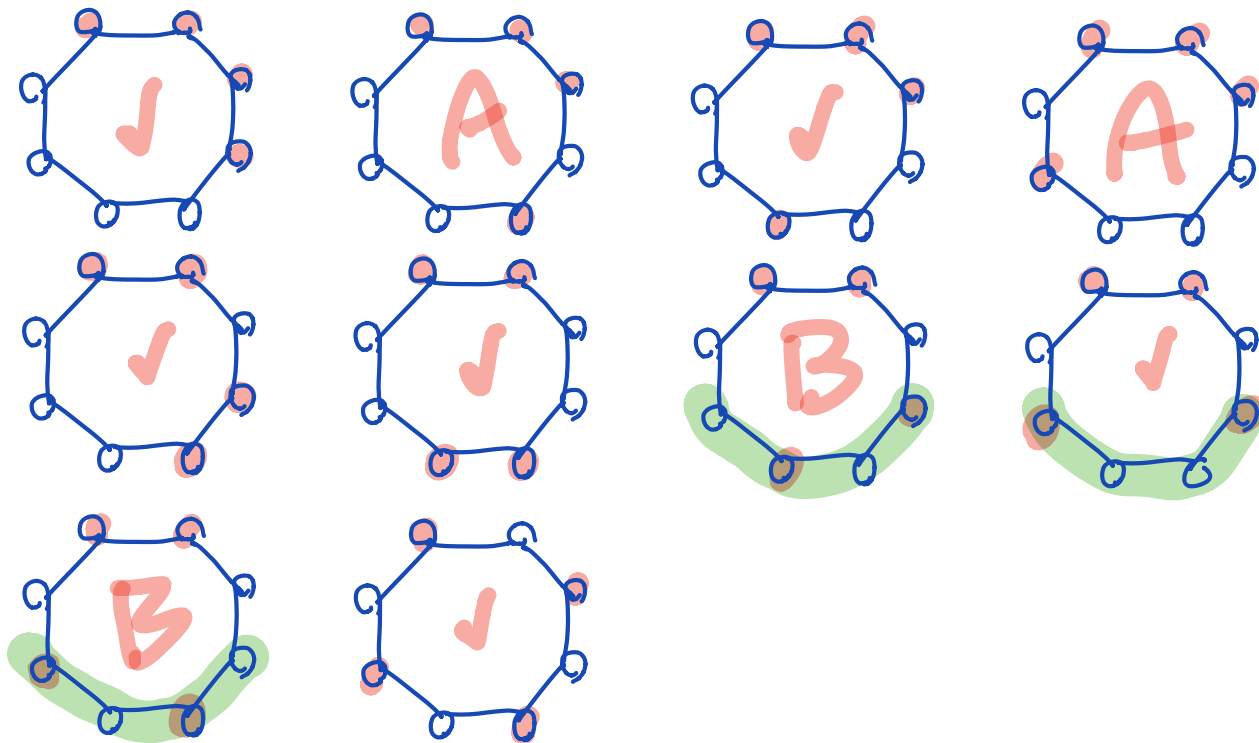
4



"1+1+2"
3
"2+2"
3



$$\binom{6}{2} = 15$$



$$\frac{1}{16} (70 + 2 \cdot 2 + 6 + 8 \cdot 6)$$

$$80 + 48$$

$$5 + 3 = 8$$