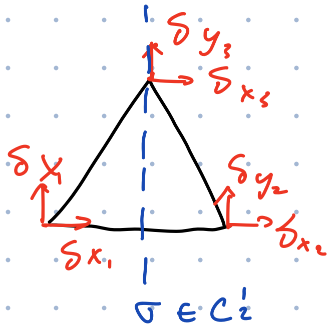
P27. use $\chi_{V_1 \otimes V_2} = \chi_{V_1} \cdot \chi_{V_2}$ and the character theory.

P28.



$D_3 \cong S_3$ three conj. classes

$E \leftrightarrow [()]$

$C_3 \leftrightarrow [(123)]$

$C_2' \leftrightarrow [(12)]$

$\chi_V(E) = 6$

$\chi_V(C_3) = 0$ ($\because$ 1, 2, 3 all switch places, all 0 on diagonal)

$\chi_V(C_2') = 0$ (σ: $\delta y_3 \to \delta y_3$, $\delta x_3 \to -\delta x_3$)

$n_P = \langle \chi_P, \chi_V \rangle$

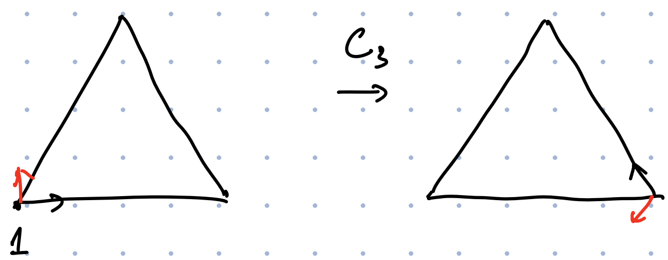
	E	$2C_3$	$3C_2'$
A_1	1	1	1
A_2	1	1	-1
E	2	-1	0
V:	6	0	0

$n_{A_1} = \frac{1}{6} 1 \times 6 = 1$

$n_{A_2} = \frac{1}{6} 1 \times 6 = 1$

$n_E = \frac{1}{6} 2 \times 6 = 2$

$V \cong A_1 \oplus A_2 \oplus 2E$



$\delta x_1\ \delta y_1\ \delta x_2\ \delta y_2\ \delta x_3\ \delta y_3$

$(1, 0, 0, 0, 0, 0) \longrightarrow$

$(0, 0, -\frac{1}{2}, \frac{\sqrt{3}}{2}, 0, 0)$

$$M(C_3) = \begin{pmatrix} 0 & 0 & \\ 0 & 0 & \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} & \cdots \\ \frac{\sqrt{3}}{2} & -\frac{1}{2} & \\ 0 & 0 & \\ 0 & 0 & \end{pmatrix}$$