Grouptheory

Written Examination, 2018. 12. 28.

1. Let G be a group, and let $G_d = \{(x, x) \mid x \in G\}$ denote the diagonal supgroup of the direct product $G \times G$. What are the different cosets of G_d in $G \times G$?

2. Ther character table of $\mathbb{D}_3 = \{1, C, C^{-1}, \sigma_1, \sigma_2, \sigma_3\}$ reads

	$\{1\}$	$\{C, C^{-1}\}$	$\{\sigma_1, \sigma_2, \sigma_3\}$
$\mathbf{1}$	1	1	1
$\mathbf{1}^*$	1	1	-1
$\mathbf{2}$	2	-1	0

   What is the irreducible decomposition of $(\mathbf{2} \oplus \mathbf{1}) \otimes (\mathbf{2} \oplus \mathbf{1}^*)$?