Mathematical Physics — PHZ 3113
Homework 10 (April 10, 2013)
Matrix Algebra

1. Find three 2×2 matrices σ_i, $i = 1, 2, 3$, which fulfill the relations

$$\sigma_i \, \sigma_j = i \, \epsilon_{ijk} \, \sigma_k \quad \text{for} \quad i \neq j \,, \quad (1)$$
$$\sigma_i \, \sigma_j + \sigma_j \, \sigma_i = 2 \, \delta_{ij} \, 1_2 \,, \quad\quad\quad (2)$$

where 1_2 is the 2×2 unit matrix.

2. Find the transformation, which generates the general solution σ'_i, $i = 1, 2, 3$ from your previous special solution.