

Solution to problem B

$$(12) = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \quad (1)$$

$$(12) = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \quad (2)$$

$$(23) = \begin{pmatrix} -1/2 & \sqrt{3}/2 \\ \sqrt{3}/2 & 1/2 \end{pmatrix} \quad (3)$$

$$(13) = \begin{pmatrix} -1/2 & -\sqrt{3}/2 \\ -\sqrt{3}/2 & 1/2 \end{pmatrix} \quad (4)$$

$$\begin{pmatrix} e & (12) & (23) & (13) & (132) & (123) \\ (12) & e & (132) & (123) & (23) & (13) \\ (23) & (123) & e & (132) & (13) & (12) \\ (13) & (132) & (123) & e & (12) & (13) \\ (132) & (13) & (12) & (23) & (123) & e \\ (123) & (23) & (13) & (12) & e & (132) \end{pmatrix} \quad (5)$$

(I left out the labels of the rows and columns.) To save writing abbreviate  $P_{12}$ , etc., by (12). Use cycle notation. Multiply from left to right. The elements of the group table are (row)(column). Work from left to right in each cycle.