

1 Matrix Exponentiation

Exponentiate the following matrices *by hand*:

$$(a) P = \begin{pmatrix} i\alpha & 0 \\ 0 & 0 \end{pmatrix}$$

$$(b) Q = \begin{pmatrix} 0 & i\beta \\ 0 & 0 \end{pmatrix}$$

(You may check your answers using computer algebra, but should attempt the calculation first without such assistance.)