Worksheet # 6

(Monday, October 9, 2023)

Name

Questions (5 pts):

As we discussed, an operator A can be represented by a matrix with elements $A_{nm} = \left\langle \varphi_n \left| A \right| \varphi_m \right\rangle, \text{ so that } A = \sum_{n,m} A_{nm} \left| \varphi_n \right\rangle \left\langle \varphi_m \right|.$

Consider a two-dimensional space and representation of A in some basis so that

$$A = \begin{pmatrix} 1 & i \\ 2i & i \end{pmatrix}$$

1) What is the matrix representing A^+ in this basis?

2) Is A Hermitian? If not, what has to be changed for it to become Hermitian? (give an example)

Is A anti-Hermitian? If not, what has to be changed for it to become anti-Hermitian? (give an example)