## Worksheet \# 6

(Monday, October 9, 2023)

## Name

Questions (5 pts):
As we discussed, an operator A can be represented by a matrix with elements $A_{n m}=\left\langle\varphi_{n}\right| A\left|\varphi_{m}\right\rangle$, so that $A=\sum_{n, m} A_{n m}\left|\varphi_{n}\right\rangle\left\langle\varphi_{m}\right|$.

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

$$
A=\left(\begin{array}{cc}
1 & i \\
2 i & i
\end{array}\right)
$$

$1) \quad$ What is the matrix representing $\mathrm{A}^{+}$in this basis?
2) Is A Hermitian? If not, what has to be changed for it to become Hermitian? (give an example)
3) Is A anti-Hermitian? If not, what has to be changed for it to become antiHermitian? (give an example)

