ECE 592-100 – Signal Processing Tour of Quantum Computing

Quiz 1– Spring 2023

February 20, 2023

Please remember to justify your answers carefully.

Last name: _____ First name: _____

Question 1 (Linear dependence.)
Consider the row vectors [1 1 1], [2 0 3], and [1 $-$ 1 2]. Explain why they are linearly dependent.

Question 2 (Diagonalizable matices.)
Consider the matrix

$$A = \begin{bmatrix} 1 & 1 \\ 2 & 0 \end{bmatrix}.$$

Show that A is not diagonalizable.

Question 3 (Square of matrix.)
The matrix A has eigen values 1 and 2. What are the eigen values of its square, A^2?