Quiz #4 (CSE 4190.313)

Thursday, May 23, 2019

Name: _____   **ID No:** _____

1. (15 points) Compute a polar decomposition $A = QS$ of the following matrix:

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

2. (5 points) What are the signs of the n eigenvalues λ_i $(i = 1, \cdots, n)$ of the following matrix? Justify your answer.

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

3. (10 points) Is there a real solution to the following equation? Justify your answer.

$$x^2 + 5y^2 + 9z^2 + 4xy + 6xz + 8yz = -1$$