

Directions: This assessment has 3 questions, for a total of 20 points. You must show all of your work to receive full credit for an answer. Remember, you may not use a calculator or any other resources during this assessment. Good luck!!

First Name: _____ Last Name: _____ # _____

1. (5 points) Find a 2×2 matrix A such that A contains at least one nonzero entry and $A^2 \neq I$ and

$$A(A - I)(A + I) = 0.$$

2. (10 points) Let $A = \begin{bmatrix} 0 & 2 & 9 \\ 1 & 3 & 7 \\ 2 & 4 & 6 \end{bmatrix}$. Find a matrix B such that the rank of B is 3 and $B^2A = B$. Be sure to show your work.

3. (5 points) Let $A = \begin{bmatrix} 1 & 3 \\ 4 & 3 \\ 5 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 & 2 \\ 4 & 3 & 2 \end{bmatrix}$. Compute AB .