Name (Last, First)

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1. (5pts) Let a 2×2 matrix A is given by

$$\begin{bmatrix} 7 & -2 \\ 4 & 3 \end{bmatrix}.$$

Find a real matrix C of the form

$$\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$$

which is similar to A.[1]

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[1]Of course, you should find the P as well. **Please check your answer.**

2. (3pts) What is the length of $-\mathbf{x}$ (negative of $\mathbf{x}$)?

$$\mathbf{x} = \begin{bmatrix} 3 \\ -5 \\ -1 \\ 1 \end{bmatrix}$$

3. (2pts) Find a 4×4 matrix A which has only one eigenvalue and the eigenspace is 2–dimensional. **Explain why.**