

Quiz 4, MATH 240, Fall 2023

Write your name clearly.

Name:

UID:

- (1) (8 points) If A and B are invertible matrices, and $AB\mathbf{x} = \mathbf{b}$, solve for \mathbf{x} .

$$\vec{x} = B^{-1}A^{-1}\vec{b}.$$

- (2) (12 points) Consider the system of equations

$$2x + y = 2,$$

$$7x + 4y = -1.$$

Use matrix inverses to solve for x and y (you *must* use matrix inverses here).

$$\text{Let } A = \begin{pmatrix} 2 & 1 \\ 7 & 4 \end{pmatrix}, \quad \vec{b} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}.$$

$$\text{Then } \vec{x} = \begin{pmatrix} 2 & 1 \\ 7 & 4 \end{pmatrix}^{-1} \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

$$= \begin{pmatrix} 4 & -1 \\ -7 & 2 \end{pmatrix} \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

$$= \begin{pmatrix} 9 \\ -16 \end{pmatrix}$$