

MATH 333

Matrices Worksheet April 8, 2008

Please work in groups of 2-4 people, and hand in your answers the following questions on separate paper.

1. Let

$$\mathbf{A} = \begin{bmatrix} 1 & -2 & 0 \\ 3 & 2 & -1 \\ -2 & 1 & 3 \end{bmatrix} \quad \text{and} \quad \mathbf{B} = \begin{bmatrix} 4 & -2 & 3 \\ -1 & 5 & 0 \\ 6 & 1 & 2 \end{bmatrix}$$

- Calculate $\mathbf{A}^T + \mathbf{B}^T$.
- Calculate $(\mathbf{A} + \mathbf{B})^T$.
- Are (a) and (b) the same? If not, how do they differ?

2. Let

$$\mathbf{x} = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} \quad \text{and} \quad \mathbf{y} = \begin{bmatrix} 1 \\ 2 \\ 2 \end{bmatrix}$$

- Calculate $\mathbf{x}^T \mathbf{y}$.
- Calculate $\mathbf{y}^T \mathbf{x}$.
- Are (a) and (b) the same? If not, how do they differ?

3. Let

$$\mathbf{A} = \begin{bmatrix} 1 & -2 & 1 \\ 0 & 2 & -1 \\ 2 & 1 & 1 \end{bmatrix} \quad \text{and} \quad \mathbf{B} = \begin{bmatrix} 2 & 1 & -1 \\ 1 & -1 & 0 \\ 2 & -1 & 1 \end{bmatrix}$$

- Calculate \mathbf{AB} .
- Calculate \mathbf{BA} .
- Are (a) and (b) the same? If not, how do they differ?

4. Let

$$\mathbf{A} = \begin{bmatrix} 3 & -1 \\ 6 & 2 \end{bmatrix}$$

- Calculate $|\mathbf{A}|$.
- Calculate \mathbf{A}^{-1} .
- Calculate \mathbf{AA}^{-1} .
- Calculate $\mathbf{A}^{-1}\mathbf{A}$.
- Are (c) and (d) the same? If not, how do they differ?