

MA 162 Recitation Worksheet Thursday September 25

1. Let

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

- Compute $(A + B)^2$.
- Compute $A^2 + 2AB + B^2$.
- From results of parts (a) and (b), show in general, $(A + B)^2 \neq A^2 + 2AB + B^2$.

2. Let

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

- Compute AB .
- Compute AC .
- Using the results of parts (a) and (b), conclude that $AB = AC$ does *not* imply that $B = C$.

3. Find a, b, c and d such that

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \cdot \begin{bmatrix} 1 & 0 \\ -1 & 3 \end{bmatrix} = \begin{bmatrix} -1 & -3 \\ 3 & 6 \end{bmatrix}.$$

4. Let

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

Find A^{-1} if it exists. Verify your answer.

5. Write the system of equations as matrix equation and solve the system by using the inverse of the coefficient matrix.

$$3x + 2y - z = 2$$

$$2x - 3y + z = -2$$

$$x - y - z = -3$$