

Math 60
Homework 8

Name _____
Due Wednesday November 9 before 4:00 PM

1. Compute the determinant of the matrix $A = \begin{bmatrix} 2 & 0 & 1 \\ -1 & 1 & 0 \\ 2 & 1 & 3 \end{bmatrix}$ using the complete expansion.

2. A matrix is *upper triangular* if all of its entries below the diagonal are zero. What can you say about the determinant of a diagonal matrix?

3. Find the inverse of the matrix

$$A = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 2 \\ 1 & 0 & 0 \end{bmatrix}$$

using the adjoint A^* .

4. Given a complex number $z = a + ib$, consider the matrix $M_z = \begin{bmatrix} a & -b \\ b & a \end{bmatrix} = a \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} + b \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$.
For $z = a + ib$ and $w = x + iy$, compare M_{zw} and $M_z M_w$. Use what you've found to find a formula for $\frac{1}{z}$.