

Math 308

Chapter 3

- (1) (after 3.2) Find a 2×3 matrix A and a 3×2 matrix B such that $AB = I_2$ but $BA \neq I_3$.
- (2) (after 3.2) Find a 2×2 matrix A , which is not the zero or identity matrix, satisfying each of the following equations.
 - a) $A^2 = 0$
 - b) $A^2 = A$
 - c) $A^2 = I_2$
- (3) (after 3.2) Let A be the matrix of transformation corresponding to the counter-clockwise rotation of the plane by $\frac{\pi}{4}$ radians. Compute A^4 without explicitly computing A .
- (4) (after 3.2) Find a matrix A such that $A^3 = 0$ but A^2 is neither the 0 matrix nor the identity matrix.
- (5) (after 3.3) Find a 3×2 matrix A and a 2×3 matrix B such that AB is invertible or explain why such matrices cannot exist. Answer the same question with the requirement that BA be invertible.