

Some theoretical results - using Inverses

- (1) $AB = AC$ and A^{-1} exists $\Rightarrow B = C$ (cancellation law)
- (2) $AB = O$ and A^{-1} exists $\Rightarrow B = O$
- (3) $A^2 = I$ and A^{-1} exists $\Rightarrow A = A^{-1}$

Square Matrices which commute (exceptions to the rule)

- (1) $AA^{-1} = A^{-1}A = I$ (a matrix and its inverse)
- (2) $AB = BA$ (if A and B are diagonal matrices)
- (3) $AI = IA = A$ (if A is square)
- (4) $AO = OA = O$ (if both A and O are square)

Square Matrices which do not have inverses

- (1) O
- (2) matrices with multiple rows (columns)
- (3) matrices with a row of zeros

In general, matrices whose determinant is zero are not invertible.