

- #20. Let  $A$  be an  $m \times n$  matrix and  $B$  be an  $n \times p$  matrix. Prove that
- $\mathbf{N}(B) \subset \mathbf{N}(AB)$ .
  - $\mathbf{C}(AB) \subset \mathbf{C}(A)$ . (Hint: Use Proposition 1.3.)
  - $\mathbf{N}(B) = \mathbf{N}(AB)$  when  $A$  is  $n \times n$  and nonsingular. (Hint: See the box on p. 15–16.)
  - $\mathbf{C}(AB) = \mathbf{C}(A)$  when  $B$  is  $n \times n$  and nonsingular.