MAT257Y – 2016/09/21 Tutorial

Munkres, section 2

4. (a) Let A be an n by n matrix of rank n. By applying elementary row operations to A, one can reduce A to the identity matrix. Show that by applying the same operations, in the same order, to I_n, one obtains the matrix A^{-1}.

   (b) Let
$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}.$$
   Calculate A^{-1} by using the algorithm suggested in (a). [*Hint:* An easy way to do this is to reduce the 3 by 6 matrix $[A \ I_3]$ to reduced echelon form.]

   (c) Calculate A^{-1} using the formula involving determinants.

Munkres, section 3

3. Let $A \subset X$. Show that if C is a closed set of X and C contains A, then C contains $\bar{A}$.

4. (a) Show that if Q is a rectangle, then Q equals the closure of Int Q.

   (b) If D is a closed set, what is the relation in general between the set D and the closure of Int D?

   (c) If U is an open set, what is the relation in general between the set U and the interior of $\bar{U}$?

5. Let $f : X \to Y$. Show that f is continuous if and only if for each $x \in X$ there is a neighborhood U of x such that $f \mid U$ is continuous.