Homework 11, due Monday, Nov.26

Correction to Exercise 8.18. The statement in the book is false. In fact show that any smooth function on $\mathbf{R}^3$ which vanishes on the torus must have a critical point somewhere inside the bounded region. Show, by a drawing or formula, that nevertheless, there is a continuous unit vexctorfield inside which extends the outerward orienting unit normal field on the torus.

Second exercise. Show that $\mathrm{Jac}\pi = N^3$ where S is a compact surface with outward unit normal $N = (N^1, N^2, N^3)$ and $\pi : S \to \mathbf{R}^2$, $\pi(x, y, z) = (x, y)$.

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Page 305 Exercise (2)

Page 307 Exercise (7)