# Math 262 Homework 3—due Thursday October 30

Fall 2008

1. (a) Prove that for any open cover $\mathcal{U}$ of a connected topological space, $\check{H}^0(\mathcal{U}, \mathbb{R}) = \mathbb{R}$.
   (b) Find a three-set open cover $\mathcal{U}$ of $S^2$ for which $\check{H}^*(\mathcal{U}, \mathbb{R}) = H^*_{\text{DR}}(S^2)$ for $* = 0, 1, 2$.
   (c) Find a three-set open cover $\mathcal{V}$ of $S^2$ for which $\check{H}^*(\mathcal{V}, \mathbb{R})$ is not identical to $H^*_{\text{DR}}(S^2)$.
2. Bott & Tu exercise II.10.5, p. 111.
3. Bott & Tu exercise II.10.7, pp. 112–113.