Problem Set 9
Due Friday, June 8.

Real Analysis

Math 131A, Spring Quarter 2018

1. Do problems 19.1, 19.2, 19.4, 19.5, 19.6, 19.7, 19.9, 19.10 in the textbook.
2. Extra credit: Let $f\colon S \to \mathbb{R}$ be a uniformly continuous and bounded function. The function $\omega\colon (0, +\infty) \to \mathbb{R}$ given by

   $$\omega(\delta) := \sup\{|f(x) - f(y)| : x, y \in S,\ |x - y| < \delta\}$$

   is called the *modulus of continuity* of f. Show that ω is increasing and $\lim_{\delta \to 0^+} \omega(\delta) = 0$.
3. Do problems 28.1, (a), (c), (e), 28.3, 28.7, 28.8 in the textbook.
4. Do problems 29.3, 29.4, 29.5, 29.13, in the textbook.
5. Do problems 32.1, 32.2, 32.8, 33.2, 33.3, in the textbook.
6. Extra credit: do problems 34.1, 34.2, 34.5 in the textbook.