MA 281, Honors Mathematical Analysis III, Spring '06. Extra Homework Sheet # 1.

- 1. Decide whether the following functions are uniformly continuous or not. Justify your answer as best as you can (a proof would be best).
 - (a) $f(x) := \cos x + x^3$ on $[0, 2\pi]$.
 - (b) $f(x) := \cos x + x^3$ on $[0, 2\pi)$.
 - (c) $f(x) := \cos x + x^3$ on \mathbb{R} .
 - (d) f(x) := 1/x on (0, 1].
 - (e) f(x) := 1 + x on \mathbb{R} .
- 2. Suppose $f:(a,b] \longrightarrow \mathbb{R}$ is continuous and $\lim_{x \to a^+} f(x)$ exists and is finite. Is f uniformly continuous?