

PROBLEM SET NO. 4 (DUE ON MONDAY, OCTOBER 27 AT
4:00 PM)

TUESDAY, 10-21

• **Problem 3:**

- (i) Prove that if f is continuous at l and $\lim_{x \rightarrow a} g(x) = l$, then $\lim_{x \rightarrow a} f(g(x)) = f(l)$.
- (ii) Show that if continuity of f at l is *not* assumed, then it is not generally true that $\lim_{x \rightarrow a} f(g(x)) = f(\lim_{x \rightarrow a} g(x))$. *Hint: Try $f(x) = 0$ for $x \neq l$, and $f(l) = 1$.*