**050.371/671 — Formal Methods in Cognitive Science**
**Problem Set 3**
**Due April 12, 1999**

**Problem 1**

Let $\mathcal{L} = \{E | E \text{ is a finite set of even numbers}\} \cup \{\mathbb{N}\}$. Give a learning function that identifies $\mathcal{L}$

**Problem 2**

Let $t$ be a text and $f$ be a (total) learning function.

a. Show that if $f$ converges on $t$, then $\{f(\bar{t}_n) | n \in \mathbb{N}\}$ is finite.

b. Why doesn't the converse of (a), i.e., it is not necessarily the case that if $\{f(\bar{t}_n) | n \in \mathbb{N}\}$ is finite, then $f$ converges on $t$.

**Problem 3**

Let $\mathcal{L} = \{\mathbb{N} - \{x\} | x \in \mathbb{N}\}$. In class we exhibited a learning function that identifies L. Show that no self-monitoring learning function identifies L.