Problem 13: For each positive integer n, let p_{2n} = 1/(2n-1) and let p_{2n-1} = 1/2n. Does the sequence $p_1, p_2, p_3...$ converges to 0. Assume e is epsilon.

Proof: Let 0 be an element of the open interval (a,b). We define e = min{|a|, |b|}

Pick N > $\frac{1}{2e} + \frac{1}{2} > \frac{1}{2e}$.

Let n > N.

n > $\frac{1}{2e} + \frac{1}{2}$

2n > $\frac{1}{e}$ + 1

2n-1 > $\frac{1}{e}$

|0-p_{2n}| = |0 - $\frac{1}{2n}$| = $\frac{1}{2n-1}$ < e.

n > $\frac{1}{2e}$.

2n > $\frac{1}{e}$

|0-p_{2n}| = |0 - $\frac{1}{2n}$| = $\frac{1}{2n}$ < e

Since $\frac{1}{2n-1}$ and $\frac{1}{2n}$ are less than epsilon, p_n is an element of (-e, e). Therefore, p_n converges to 0.