

## 2) Stopping criteria.

The bisection method generates a sequence

$$p_n = \frac{a_n + b_n}{2}$$

The main question is: When do we stop?  
Given some tolerance  $\epsilon$  we may compute

$$p_1, p_2, \dots, p_N$$

until one of the following criteria is met

a)  $\left| \frac{b_n - a_n}{2} \right| < \epsilon$  Only works for the Bisection method

b)  $|p_n - p_{n-1}| < \epsilon$

This however, does not guarantee that the sequence converges.

Ex:  $p_n = \sum_{k=1}^n \frac{1}{k}$   $p_n - p_{n-1} = \frac{1}{n} \rightarrow 0 \quad n \rightarrow \infty$

however,  $p_n \rightarrow \infty$