The class algorithm stops when $\dfrac{b_i - a_i}{2} < \epsilon =$ tolerance.

Other stopping methods commonly used:

(1)$|p_i - p_{i+1}| < \epsilon$.

Problem: there are cases where $p_i - p_{i+1} \to 0$, but $\{p_i\}$ diverges.

Example: $p_i = \displaystyle\sum_{n=1}^{i} \frac{1}{n}$

(2) $|f(p_i)| < \epsilon$

Problem: p_i might not be near p.

(3) $\dfrac{|p_i - p_{i+1}|}{|p_i|} < \epsilon$.

Usually the best without other information.

EXAMPLE. Find the solution of $2 + \cos(e^x - 2) - e^x = 0$ on $[0.5, 1.5]$ to within 10^{-3}.

$\dfrac{b-a}{2^n} < 10^{-3} \iff \dfrac{1}{2^n} < 10^{-3} \iff 2^n > 1000 \iff n > \log_2 1000 \approx 9.97.$

Thus 10 is an upper bound on the number of iterations necessary to give us the accuracy required.