c) $|f(p_N)| < \varepsilon$

This may result in a poor approximation of p_N

Ex. $f(x) = (x-1)^{10}$ $p_n = 1 + \frac{1}{n}$

$$|f(p_2)| = \left(\tfrac{1}{2}\right)^{10} = \frac{1}{1024} < \frac{1}{1000} = 10^{-3}$$

Thus

$$|f(p_2)| < 10^{-3}$$

$p_2 = 1.5$ is a poor approximation of the root 1.

d) $\dfrac{|p_N - p_{N-1}|}{|p_N|} < \varepsilon$ Best stopping criterion

This is closest to computing the relative error. Note, we can't compute exactly the relative error because we don't know the solution

Note: One should try to find the smallest possible interval with a root.