



$$P_1 = \frac{a_1 + b_1}{2}$$

$$\text{If } f(a_1)f(P_1) < 0 \rightarrow \begin{cases} b_2 = P_1 \\ a_2 = a_1 \end{cases} \quad \text{or} \quad \begin{cases} f(b_1)f(P_1) < 0 \\ a_2 = P_1 \\ b_2 = b_1 \end{cases}$$

$$P_2 = \frac{a_2 + b_2}{2}$$

$$f(b_2)f(P_2) < 0$$

$$\begin{matrix} a_3 = P_2 \\ b_3 = b_2 \end{matrix} \rightarrow P_3 = \frac{a_3 + b_3}{2}$$

$$\text{diff} = \left| \frac{b_n - a_n}{2} \right|; \text{diff} < \text{TOL}$$

$$\text{TOL} = 10^{-4}$$