

8. Prove that the function  $f(x) = \frac{x}{2} - \cos x$  has a **unique** root on the interval  $[0, \pi/2]$ . How many iterations of the Bisection algorithm are necessary to approximate this root with an absolute error less than  $5 \times 10^{-5}$ . You do not have to compute the approximation but you have to prove existence and uniqueness without using a graph of the function.