6 **(a)** By sketching a suitable pair of graphs, show that the equation

$$|x-2| = 2\sin\tfrac{1}{2}x$$

has only one root in the interval $0 < x < \pi$. [2]

(b) Show by calculation that this root lies between 1 and 1.5. [2]

(c) Use the iterative formula $x_{n+1} = 2 - 2\sin\tfrac{1}{2}x_n$ with an initial value of 1.03 to calculate the root correct to 2 decimal places. Give the result of each iteration to 4 decimal places. [3]