# Bisection - Good for More than Root Finding

The 'Golden Ratio' is a mathematical constant given by the expression $\varphi = \frac{1+\sqrt{5}}{2}$. Much like $\pi$ or $e$, $\varphi$ is an irrational number that crops up in all kinds of unexpected places in science and mathematics.

(a) Explain how one might use the Bisection method to approximate $\varphi$.

(b) Based on your answer to (a), estimate the number of iterations needed to approximate $\varphi$ to within $10^{-1}$.

(c) Carry out 3 iterations of bisection to estimate $\varphi$. How close did you get?

.

# Graphical Root Finding

Consider the function plotted below:
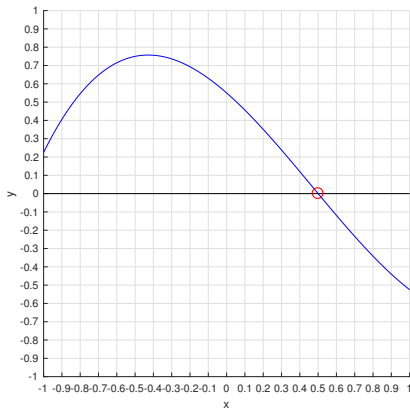


Draw a detailed figure to find $x_5$ using secant method. Based on your figure, can you give a guess as to what the value of the root is?