

Numerical Methods: Homework #3

Based on Newton-Raphson Method

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Problem 1

Find a positive root of $x^4 - x = 10$ correct to three decimal places, using Newton-Raphson method.

Problem 2

Find the root of the equation $\cos x = xe^x$ using Newton-Raphson method correct to four decimal places.

Problem 3

Use the Newton-Raphson method to find the fourth root of 32 correct to three decimal places.

Problem 4

Let N be any positive real number. Show that the iterative formula to find \sqrt{N} using Newton-Raphson method is

$$x_{n+1} = \frac{1}{2} \left(x_n + \frac{N}{x_n} \right).$$

Problem 5

Evaluate $30^{-\frac{1}{5}}$ correct to four decimal places by Newton's iteration method.

Problem 6

Find the negative root of the equation $x^3 - 21x + 3500 = 0$ correct to two decimal places by Newton's method.