

ESP
Kouba
Worksheet 14 1/2

- 1.) Use Newton's Method to estimate the root of $7x^3 + x - 5 = 0$ to four decimal places.
- 2.) Use Newton's Method to estimate the largest root of $x^3 + 6x^2 + 9x + 1 = 0$ to four decimal places.
- 3.) Use Newton's Method to estimate the root of $\cos x = 2x$ to four decimal places.
- 4.) Use Newton's Method to estimate $10^{1/3}$ to four decimal places.
HINT : Solve $x^3 - 10 = 0$.
- 5.) Consider the graph of $f(x) = x^{1/3}$. Clearly, the root of $f(x) = 0$ is $x = 0$. Set up Newton's Method with $x_1 = 1$ and discover what happens when you compute x_2, x_3, x_4 , and x_5 . What do you conjecture?
- 6.) For this problem assume that $D \ln x = \frac{1}{x}$. Consider the function $f(x) = \frac{1 + \ln x}{x}$. Set up Newton's Method to estimate the root of $f(x) = 0$.
 - a.) Let $x_1 = 1.2$ and discover what happens when you compute x_2, x_3 , and x_4 .
 - b.) Let $x_1 = 0.5$ and discover what happens when you compute x_2, x_3 , and x_4 .
 - c.) Sketch a graph of f . What do you conjecture based on this graph and your work in a.) and b.)?