

Derive a method to find solutions to the system of non-linear equations $f(x, y) = 0$ and $g(x, y) = 0$ of two variables. Use it to find the solution to the system of non-linear equations that you had to solve in Quiz 3 on Gaussian Quadrature.

Note: For $f(x) = 0$ using Taylor series with $x \approx x_{k+1} = x_k + h$ we have

$$0 \approx f(x_{k+1}) = f(x_k + h) \approx f(x_k) + hf'(x_k), \text{ i.e. } h = x_{k+1} - x_k \approx -\frac{f(x_k)}{f'(x_k)}.$$

We define $x_{k+1} = x_k - \frac{f(x_k)}{f'(x_k)}$. In this example use two variable Taylor series for $f(x, y)$ and $g(x, y)$ with $x_{k+1} = x_k + h$ and $y_{k+1} = y_k + \ell$. Write the code in your preferred language, include your name, index number and field as a comment in the code. Print the code and the output and handover to your tutor on or before 24/11/2017, highlight your information. Please see 2DNewton.pdf for a sample code in MATHEMATICA.