How to Solve Three Nonlinear equations

The algorithm for solving the system of two equations and two unknowns,

$$f(x,y)=0, \qquad g(x,y)=0,$$

is given by the following two-step process.

1. Solve the linear system for Δx_n and Δy_n given by

$$\begin{pmatrix} f_x & f_y \\ g_x & g_y \end{pmatrix} \begin{pmatrix} \Delta x_n \\ \Delta y_n \end{pmatrix} = \begin{pmatrix} -f \\ -g \end{pmatrix}.$$

2. Advance the iterative solution, using

$$x_{n+1}=x_n+\Delta x_n, \qquad y_{n+1}=y_n+\Delta y_n.$$

Write down the corresponding algorithm for three equations and three unknowns.

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