1. Create a program to find the minimum of **4** numbers.

2. Newton's method extends to higher dimensions. Suppose that $\mathbf{F}(\mathbf{x})$ is a vector function of $\mathbf{x}$. The zeros of this functions can be found iteratively by Newton's formula

$$\mathbf{x}_{n+1} = \mathbf{x}_n - J^{-1}(\mathbf{x}_n)\mathbf{F}(\mathbf{x_n}),$$

where $J^{-1}(\mathbf{x})$ is the inverse of the Jacobian matrix for $\mathbf{F}(\mathbf{x})$. ($J(\mathbf{x}) = \left[\frac{\partial f_i}{\partial x_j}\right]$.)

a. Write a Maple procedure to solve the equation $\mathbf{F}(\mathbf{x}) = \mathbf{0}$. The procedure should include inputs for initial conditions, number of iterations, and a tolerance for the error (sum of the absolute difference between all the components of two successive iterates, $\mathbf{x}_n$ and $\mathbf{x}_{n+1}$).

b. Use your procedure to find the zeros of the function

$$\mathbf{F}(\mathbf{x}) = \begin{pmatrix} f_1(x_1, x_2) \\ f_2(x_1, x_2) \end{pmatrix} = \begin{pmatrix} x_1^2 + x_2^2 - 4 \\ x_1 x_2 + e^{x_1 x_2} \end{pmatrix}.$$

From a symmetry argument determine how many zeros this function has.

c. Use Maple's fsolve command to check your answer.