

Example 1 (Taken from MATLAB help and adapted to the MBS)

This example solves the system of two equations and two unknowns:

$$\begin{aligned}2x_1 - x_2 &= e^{-x_1} + L_1 \\ -x_1 + 2x_2 &= e^{-x_2} + L_2\end{aligned}$$

L_1 and L_2 are geometrical parameters that remain constant.

Rewrite the equations in the form $F(x) = 0$:

$$\begin{aligned}2x_1 - x_2 - e^{-x_1} - L_1 &= 0 \\ -x_1 + 2x_2 - e^{-x_2} - L_2 &= 0\end{aligned}$$

Start your search for a solution at $x_0 = [-5 \ -5]$. (Initial guess)

First, write a file that computes F , the values of the equations at x .

```
function F = pos(x,L1,L2)
F = [2*x(1) - x(2) - exp(-x(1))-L1;
     -x(1) + 2*x(2) - exp(-x(2))+L2];
```

Save this function file as `pos.m` somewhere on your MATLAB path. Next, set up the initial point and options and call `fsolve`:

```
x0 = [-5; -5]; % Make a starting guess at the solution
[x] = fsolve('pos',x0,options,L1,L2)
```