Problem 4:
We are given the following polynomial:
\[ a_3 s^3 + a_2 s^2 + a_1 s + a_0 \]
where the nominal values of the coefficients \( a_i, i = 0,1,2,3 \) are given by
\[ a_3 = 4, \quad a_2 = 3, \quad a_1 = 2, \quad a_0 = 1. \]

Find upper bounds on \( a_3 \) and \( a_1 \), for which the polynomial is (robustly) stable.

(For those who want some further explanation of this question:
Keeping \( a_2 \) and \( a_0 \) constant at their respective nominal values, we allow \( a_3 \) and \( a_1 \) to simultaneously and independently vary upwards from their respective nominal values and subsequently we want to find the maximum values for these coefficients for which the polynomial remains stable.)