Aufgabe2_1

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(Computation via erlang shell, which should guarantee unlimited accuracy)

Algorithm 1

$K_{00} = \frac{a}{a^2} \cdot \frac{\partial a^2}{\partial a} = \frac{1}{a} \cdot a = 1$

$K_{01} = \frac{b}{b} \cdot \frac{\partial b}{\partial b} = 1 \cdot 1 = 1$

$K_{10} = \frac{a}{a} \cdot \frac{\partial a}{\partial a} = 1 \cdot 1 = 1$

$K_{11} = \frac{b}{b^2} \cdot \frac{\partial b^2}{\partial b} = \frac{1}{b} \cdot b = 1$

$K_{21} = \frac{\eta_1}{\eta_1 - \eta_2} \cdot \frac{\partial \eta_1 - \eta_2}{\partial \eta_1} = \frac{\eta_1}{\eta_1 - \eta_2} \cdot (1 - 0) = \frac{0.14666249202118384}{8.4252049781241 57 \cdot 10^{-13}} \approx 17.4 \cdot 10^{10}$

Algorithm 2

$K_{00} = \frac{a}{a} \cdot \frac{\partial a}{\partial a} = 1 \cdot 1 = 1$ $K_{01} = \frac{b}{b} \cdot \frac{\partial b}{\partial b} = 1 \cdot 1 = 1$

$K_{02a} = \frac{a}{a+b} \cdot \frac{\partial a+b}{\partial a} = \frac{a}{a+b} \cdot (1 + 0) = \frac{0.38296539272}{0.7659307854389} \approx 0.5$

$(K_{02b} = \frac{b}{a+b} \cdot \frac{\partial a+b}{\partial b} \approx 0.5$

$K_{02} = K_{02b} + K_{02a}$ (With that step I am not absolutely sure.)

$K_{10} = \frac{\eta_1}{\eta_1} \cdot \frac{\partial \eta_1}{\partial \eta_1} = 1 \cdot 1 = 1$

$K_{12a} = \frac{a}{a-b} \cdot \frac{\partial a-b}{\partial a} = \frac{a}{a-b} \cdot (1 - 0) \approx 3.48 \cdot 10^{10}$

$K_{12b} = \frac{b}{a-b} \cdot \frac{\partial a-b}{\partial b} \approx -K_{12a}$ (with K_{12} same Problem as K_{02})

$K_{20} = \frac{\eta_1}{\eta_1 \cdot \eta_2} \cdot \frac{\partial \eta_1 \cdot \eta_2}{\partial \eta_1} = \frac{1}{\eta_2} \cdot \eta_2 = 1$

(same with $K_{20} = \frac{\eta_2}{\eta_2 \cdot \eta_1} \cdot \frac{\partial \eta_2 \cdot \eta_1}{\partial \eta_2}$)