SYSTEM OF TWO LINEAR DIFFERENTIAL EQUATIONS

NAME : **SYSLINDEQUAT** ***v1.2***

The program solves a system of two linear differential equations being given in the form:

$$y1' = r1 * y1 + s1 * y2 + g1(x)$$
$$y2' = r2 * y1 + s2 * y2 + g2(x),$$

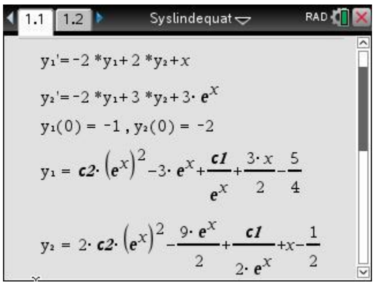
where g1(x) and / or g2(x) may be zero (homogeneous form).
If desired, the internal integration constants c_{n} and c_{n+1}, respectively may be calculated for a given set of initial conditions as: x_0, $y1(x_0)$ and $y2(x_0)$. **Please note** that in this case the highest index n for c_{n} and c_{n+1} may be **29** (c_{29} and c_{30}) , i. e. fifteen calculation with initial conditions are possible. After this limit is reached, leave, store and restart the program to set back the constants to c_1 and c_2 !

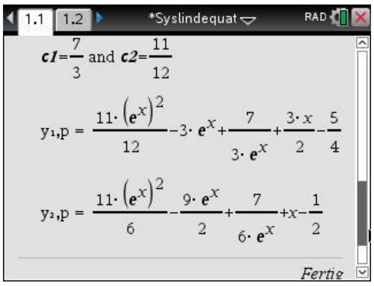
EXECUTION:

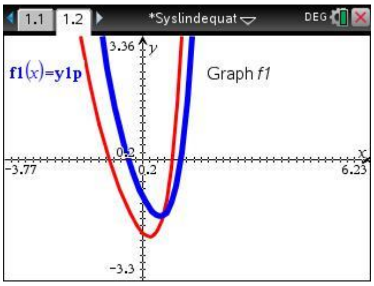
Transfer the program to MyLib and choose ***Syslindequat***. Then press the **var**-key and select the variable syslinde , press enter . Complete the brackets to ***syslinde***(r1,s1,r2,s2,g1,g2), enter .
The program then prompts to enter x_0. For a common solution with constants leave **x** in the display for x_0, all further inputs are then suppressed. Otherwise enter a value for x_0 followed by $y1(x_0)$ and $y2(x_0)$.
The results are the equations for y1(x) and y2(x) in a common form and, if you entered $y1(x_0)$ and $y2(x_0)$, the constants of integration c_{n} and c_{n+1} in the above-mentioned form and the particular solution y1,p(x) and y2,p(x) with regard to c_{n} and c_{n+1}.

EXAMPLE:

To solve the system: $y1' = -2*y1+2*y2+x$; $y2' = -2*y1+3*y2+3*e^x$; $y1(0) = -1$; $y2(0) = -2$
enter ***syslinde***(-2,2,-2,3,x,3*e^x), then in the following prompts for x_0, $y1(x_0)$ and $y2(x_0)$ key in 0, -1, and -2.
The solution is:







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