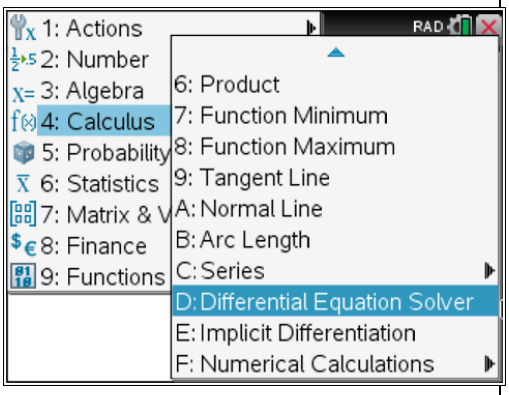
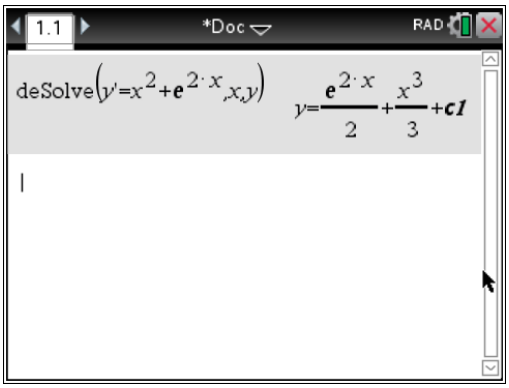
SOLVING DIFFERENTIAL EQUATIONS ON TI NSPIRE CAS.

To solve type I differential equation $\frac{dy}{dx} = x^2 + e^{2x}$ you need to re-write it in the following form: $y' = x^2 + e^{2x}$

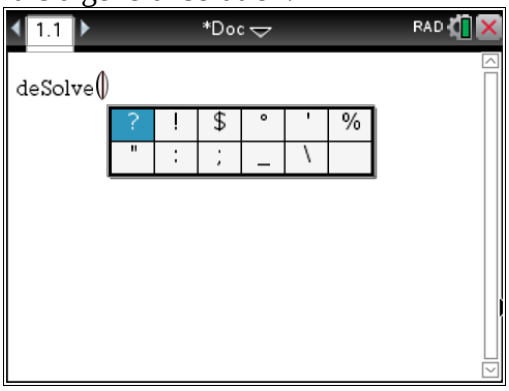
Then select F3,

deSolve($y' = x^2 + e^{2x}$,x,y)





The answer is given with the constant c1 as it is a general solution.

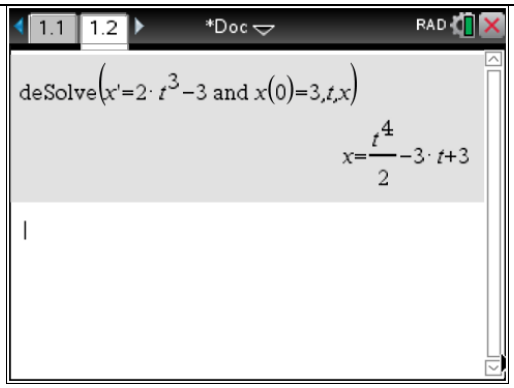


To find the particular solution to the following DE:

$\frac{dx}{dt} = 2t^3 - 3,\ x(0) = 3$, type

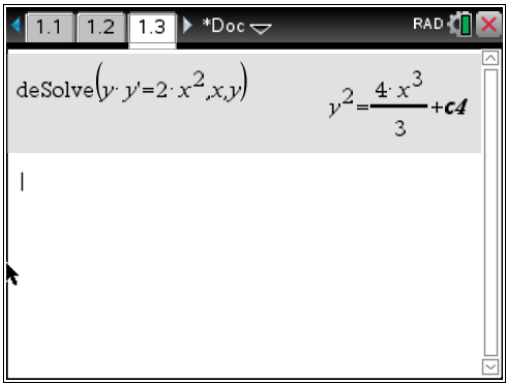
deSolve(

$x' = 2t^3 - 3\ and\ x(0) = 3, t, x)$



Sometimes the general solution to a DE can be given implicitly as in the following example:

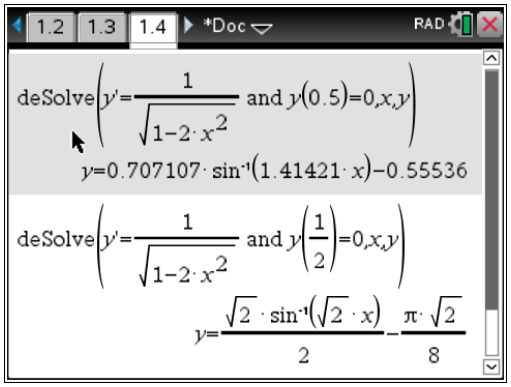
$y\frac{dy}{dx} = 2x^2$



Try the following DE:

$\frac{dy}{dx} = \frac{1}{\sqrt{1-2x^2}},\ y(0.5) = 0$

Notice the exact values versus decimal values depending on how the initial condition was entered.

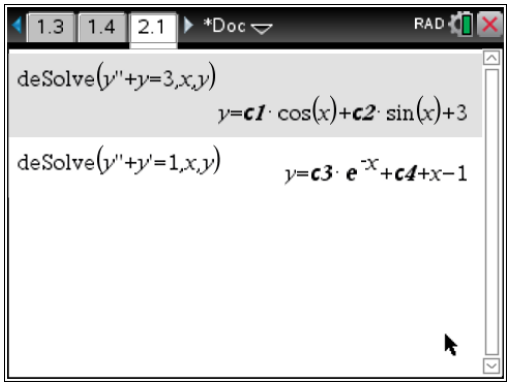


To solve the second order differential equation such as:

a. $\frac{d^2y}{dx^2} + y = 3$

b. $\frac{d^2y}{dx^2} + \frac{dy}{dx} = 1$ type as shown on the right:

General solutions are obtained above.



To find the particular solution to the following second order DE:

$\frac{d^2y}{dx^2} + \frac{dy}{dx} = 1,$

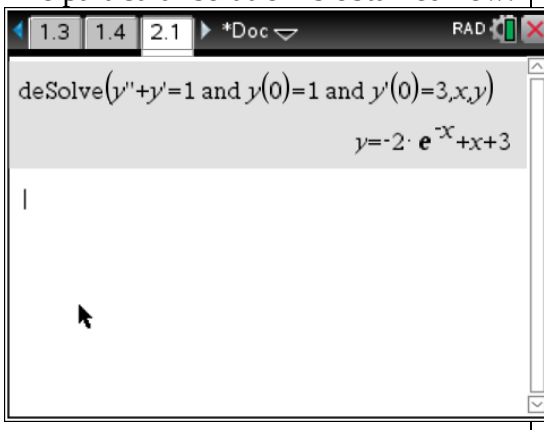
$\frac{dy}{dx} = 3 \text{ and } y = 1 \text{ when } x = 0.$

Type:

deSolve(

$y'' + y' = 1 \text{ and } y(0) = 1 \text{ and } y'(0) = 3, x, y)$

The particular solution is obtained now.



We can solve even more complicated equations using TI Nspire CAS.