Classpa	d Help Series sponsored by Casio Education Australia	www.casioed.net.au		
	Use dSelve With Simple Harmonic	Author	Charlie Watson	
271	Use usure with simple harmonic	Date	31 January 2010	
2/1	Equations	CPM OS	03.04.4000	

Start in Main.

With a second order differential equation such as x'' = -9x, Classpad reminds us that a trig solution is appropriate.

Enter the equation (using the **mth** tab and **CALC**) and tap **EXE**.

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Select a copy of the equation.

Tap Interactive, Advanced, dSolve.

Set the variables and tap **OK**.

Classpad returns constants as **const(1)**, **const(2)** and so on.

Scroll to the right to see the complete solution.







Replacing const(1), const(2) with a, b, etc is often a good idea.

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$\mathbf{x}^{*}=-9\cdot\mathbf{x}$								
$\{x = \cos(3 \cdot t) \cdot \operatorname{const}(1) + s \}$								
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If some conditions are known, such as when $t = \frac{\pi}{12}$, x = 0 and when

 $t = \frac{\pi}{4}$, x = 4 then these can be used with the simultaneous solver to determine the values of the constants *a* and *b*.



🎔 Edit Action Interactive ै।। x"=-9 dSolve(x"=-9·x,t,x) $\{x=\cos(3\cdot t)\cdot const(1)\}$ $a\cos(3\cdot t)+b\sin(3\cdot t)$ x=a·cos(3·t)+b·sin(3·t) (3·t)|*t*=π/12|*x*=0 b \boldsymbol{a} $\{a=-2\cdot\sqrt{2},b=2\cdot\sqrt{2}\}$ Define f(t)=-2·√2 ·co≤) done f(π/8) **{2**•(√2 +2) √<u>2</u>+2 12.1 f(π/8) 1.530733729 Alg Standard Real Rad 🚥

To keep the function manageable, define it as f(t).