FUNCIÓN DELTA DE DIRAC - $\boldsymbol{\delta(t)}$

1	$\delta(t) = \begin{cases} 0 & si \;\; t \neq 0 \\ \infty & si \;\; t = 0 \end{cases}$	$\int_{-\infty}^{\infty} \delta(t)dt = \int_{-a}^{a} \delta(t)dt = 1 \;,\;\; a > 0$
2	$\phi(t)$ es una función continua en un intervalo I y cero fuera de ella $\int_{-\infty}^{\infty} \delta(t)\phi(t)dt = \phi(0) \;,\;\; 0 \epsilon I$	
3	$\int_{-\infty}^{\infty} \delta(t-t_0)\phi(t)dt = \int_{-\infty}^{\infty} \delta(t)\phi(t+t_0)dt = \phi(t_0) \;\;,\;\; t_0 \epsilon I$	
4	$\int_{-\infty}^{\infty} \delta(t-t_0)g(t)dt = \begin{cases} g(t_0) & si \;\;\; a < t_0 < b \\ 0 & si \;\;\; t_0 \notin [a,b] \end{cases}$	
5	$\int_{a}^{b} \delta(t-t_0)dt = \begin{cases} 1 & si \;\;\; a < t_0 < b \\ 0 & si \;\;\; t_0 \notin [a,b] \end{cases}$	
6	$f(t)\delta(t) = f(0)\delta(t)$, siendo $f(t)$ continua en $t = 0$	
7	$t\delta(t) = 0 \quad , \quad \delta(at) = \frac{1}{\lvert a \rvert}\delta(t) \quad , \quad \delta(-t) = \delta(t)$	
8	$\int_{-\infty}^{\infty} \delta\,'(t)\,\phi(t)dt = -\int_{-\infty}^{\infty} \delta(t)\,\phi\,'(t) = -\phi\,'(0)$	
9	$\int_{-\infty}^{\infty} \delta\,'(t-t_0)\phi(t)dt = -\,\phi\,'(t_0)$	
10	$\int_{-\infty}^{\infty} \delta^{(n)}\,(t)\phi(t)dt = (-1)^n \int_{-\infty}^{\infty} \delta(t)\,\phi^{(n)}(t) = (-1)^n \phi^{(n)}(0)$	
11	$\int_{-\infty}^{\infty} f\,'(t)\,\phi(t)dt = -\int_{-\infty}^{\infty} f\,(t)\,\phi'(t)dt$	
12	$[f(t)\delta(t)]\,' = f(t)\delta\,'(t) + f'(t)\delta(t)$	
13	$f(t)\delta\,'(t) = f(0)\delta\,'(t) - f\,'(0)\delta\,(t)$	
14	$\delta(t) = \frac{d\,u(t)}{dt}$	$\delta^{(n)}(t) = \frac{d^n\,\delta(t)}{dt^n} \quad , \quad n = 1,2,\ldots$

ALGUNAS FÓRMULAS DE LA MATEMÁTICA

1	$\text{sen}(a+b)=\text{sen}(a)\cos(b)+sen(b)\cos(a)$ $\text{sen}(a-b)=\text{sen}(a)\cos(b)-sen(b)\cos(a)$ $\cos(a+b)=\cos(a)\,cos(b)-\text{sen}(a)\text{sen}(b)$ $\cos(a-b)=\cos(a)\,cos(b)+\text{sen}(a)\text{sen}(b)$	
2	$\text{sen}(a+b)+\text{sen}(a-b)=2\,\text{sen}(a)\cos(b)$ $\text{sen}(a+b)-\text{sen}(a-b)=2\,\text{sen}(b)\cos(a)$ $\cos(a+b)+\cos(a-b)=2\cos(a)\cos(b)$ $\cos(a+b)-\cos(a-b)=-2\,\text{sen}(a)\text{sen}(b)$	
3	$\cos(2a)=\cos^2(a)-\text{sen}^2(a)$ $\cos(2a)=2\cos^2(a)-1$ $\cos(2a)=1-2\text{sen}^2(a)$	$\text{sen}(2a)=2\text{sen}(a)\cos(a)$
4	$\int_a^b f(x)dx=-\int_b^a f(x)dx$	$\int_a^b f(x)dx=-\int_{-a}^{-b} f(-y)dy$
5	$\int_{-L}^{L} f(x)dx=0$ si f es **impar** en $[-L,L]$	
6	$\int_{-L}^{L} f(x)dx=2\int_0^L f(x)dx$ si f es **par** en $[-L,L]$	
7	$\int te^{bt}dt=\frac{e^{bt}(bt-1)}{b^2}+C$	
8	$\int t^2e^{bt}dt=\frac{e^{bt}(b^2t^2-2bt+2)}{b^2}+C$	
9	$\int t\cos(at)dt=\frac{\cos(at)+at\,\text{sen}(at)}{a^2}+C$	
10	$\int t\,\text{sen}(at)dt=\frac{\text{sen}(at)-at\cos(at)}{a^2}+C$	
11	$\int e^{bt}\cos(at)dt=\frac{e^{bt}(a\,\text{sen}(at)+b\cos(at))}{a^2+b^2}+C$	
12	$\int e^{bt}\,\text{sen}(at)dt=\frac{-e^{bt}(a\cos(at)-b\,sen(at))}{a^2+b^2}+C$	