

Trigonometric Identities
$\sin(a \pm b) = \sin(a) \cos(b) \pm \sin(b) \cos(a)$
$\cos(a \pm b) = \cos(a) \cos(b) \mp \sin(a) \sin(b)$
$\sin(a) \sin(b) = \frac{1}{2}(\cos(a - b) - \cos(a + b))$
$\sin(a) \cos(b) = \frac{1}{2}(\sin(a + b) + \sin(a - b))$
$\cos(a) \cos(b) = \frac{1}{2}(\cos(a - b) + \cos(a + b))$

Particular Trigonometric Values					
	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$
sin	0	1/2	$\sqrt{2}/2$	$\sqrt{3}/2$	1
cos	1	$\sqrt{3}/2$	$\sqrt{2}/2$	1/2	0

Fourier Series, Period $2L$	$f(x) = a_0 + \sum_{n=1}^{\infty} \left[ a_n \cos\left(n \frac{\pi x}{L}\right) + b_n \sin\left(n \frac{\pi x}{L}\right) \right]$
$a_0 = \frac{1}{2L} \int_{-L}^L f(x) dx, a_n = \frac{1}{L} \int_{-L}^L f(x) \cos\left(n \frac{\pi x}{L}\right) dx, b_n = \frac{1}{L} \int_{-L}^L f(x) \sin\left(n \frac{\pi x}{L}\right) dx.$	

Fourier transform of $f(x)$ :	$\hat{f}(k) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} f(x) e^{-ikx} dx.$
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$f(t)$	$\mathcal{L}(f(t))(s)$
1	$\frac{1}{s}$
$t^n$	$\frac{n!}{s^{n+1}}$
$e^{at}$	$\frac{1}{s-a}$
$\cos(\omega t)$	$\frac{s}{s^2 + \omega^2}$
$\sin(\omega t)$	$\frac{\omega}{s^2 + \omega^2}$
$\delta(t - a)$	$e^{-as}$
$u(t - a)$	$\frac{e^{-as}}{s}$

Formula	Name
$\mathcal{L}(e^{at} f(t)) = F(s - a)$	First Shifting Th.
$\mathcal{L}(f') = sF(s) - f(0)$	Differentiation
$\mathcal{L}(f(t - a)u(t - a)) = e^{-as}F(s)$	Second Shifting Th.
$\mathcal{L}(tf(t)) = -F'(s)$	Differentiation of $F$