Formulas of possible use

$\sin 2x$	$=$	$2\sin x\cos x$	$\mathscr{L}\{t^n\}$	$=$	$\dfrac{n!}{s^{n+1}}$
$\cos 2x$	$=$	$\cos^2 x - \sin^2 x$	$\mathscr{L}\{e^{at}\}$	$=$	$\dfrac{1}{s-a}$
$\sin^2 x$	$=$	$\dfrac{1-\cos 2x}{2}$	$\mathscr{L}\{\sin bt\}$	$=$	$\dfrac{b}{s^2+b^2}$
$\cos^2 x$	$=$	$\dfrac{1+\cos 2x}{2}$	$\mathscr{L}\{\cos bt\}$	$=$	$\dfrac{s}{s^2+b^2}$
$\sin(x+y)$	$=$	$\sin x\cos y + \cos x\sin y$	$\mathscr{L}\{e^{at}f(t)\}$	$=$	$F(s-a)$, where $F(s) = \mathscr{L}\{f\}$.
$\cos(x+y)$	$=$	$\cos x\cos y - \sin x\sin y$	$\mathscr{L}\{tf(t)\}$	$=$	$-\dfrac{d}{ds}\mathscr{L}\{f\}$
$\int \tan u\,du$	$=$	$-\ln\lvert\cos u\rvert$	$\mathscr{L}\{f'(t)\}$	$=$	$s\mathscr{L}\{f\} - f(0)$
$\int \cot u\,du$	$=$	$\ln\lvert\sin u\rvert$	$\mathscr{L}\{u(t-a)f(t)\}$	$=$	$e^{-as}\mathscr{L}\{f(t+a)\}$
$\int \sec u\,du$	$=$	$\ln\lvert\sec u + \tan u\rvert$	$\mathscr{L}\{f, \text{period } T\}$	$=$	$\dfrac{\mathscr{L}\{f_T\}}{1-e^{-sT}}$
$\int \csc u\,du$	$=$	$\ln\lvert\csc u - \cot u\rvert$,	$\mathscr{L}\{\delta(t-a)\}$	$=$	e^{-as}
			$\mathscr{L}\{f*g\}$	$=$	$\mathscr{L}\{f\}\mathscr{L}\{g\}$, where
			$f*g$	$=$	$\int_0^t f(t-v)g(v)\,dv$

Variation of parameters

$ay'' + by' + cy = f(t)$ has solution $y(t) = C(t)y_1(t) + D(t)y_2(t)$ where

$$C = \int \frac{-fy_2}{a(y_1y_2' - y_2y_1')}\,dt$$

$$D = \int \frac{fy_1}{a(y_1y_2' - y_2y_1')}\,dt$$