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Information for exam #1 in 421:03

Function	**Laplace Transform**
$f(t)$	$F(s) = \int_0^\infty e^{-st} f(t)\, dt$
$af(t) + bg(t)$	$aF(s) + bG(s)$
t^n (positive integer n)	$\frac{n!}{s^{n+1}}$
e^{at}	$\frac{1}{s-a}$
$\sin(kt)$	$\frac{k}{s^2+k^2}$
$\cos(kt)$	$\frac{s}{s^2+k^2}$
$e^{at}f(t)$	$F(s-a)$
$\mathcal{U}(t-a)f(t-a)$	$e^{-as}F(s)$
$g(t)\mathcal{U}(t-a)$	$e^{-as}\mathcal{L}\{g(t+a)\}$
$f'(t)$	$sF(s) - f(0^+)$
$f^{(n)}(t)$	$s^nF(s) - s^{n-1}f(0) - \ldots - f^{(n-1)}(0)$
$(f*g)(t) = \int_0^t f(t-\tau)g(\tau)\, d\tau$	$F(s)G(s)$
$\delta(t-a)$	e^{-as}
$\int_0^t f(w)\, dw$	$\frac{1}{s}F(s)$
$t^n f(t)$	$(-1)^n \frac{d^n}{ds^n}F(s)$
$f(t+T) = f(t)$ (periodic)	$\frac{1}{1-e^{-sT}} \int_0^T e^{-st} f(t)\, dt$

$$\sin(A+B) = \sin A \cos B + \cos A \sin B$$
$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$