

## Table of Laplace Transforms

Updated Nov 2017

$f(t)$	$F(s)$	Notes
1. $e^{at}$	$\frac{1}{s-a} \quad s > a$	Sect 6.1
2. $t^n, \quad n \text{ pos int}$	$\frac{n!}{s^{n+1}}, \quad s > 0$	Sect 6.1
3. $\sin(at)$	$\frac{a}{s^2 + a^2}, \quad s > 0$	Sect 6.3
4. $\cos(at)$	$\frac{s}{s^2 + a^2}, \quad s > 0$	Sect 6.3
5. $e^{at} \sin(bt)$	$\frac{b}{(s-a)^2 + b^2}, \quad s > a$	Sect 6.3
6. $e^{at} \cos(bt)$	$\frac{s-a}{(s-a)^2 + b^2}, \quad s > a$	Sect 6.3
7. $t \sin(at)$	$\frac{2as}{(s^2 + a^2)^2}, \quad s > a$	
8. $t \cos(at)$	$\frac{s^2 - a^2}{(s^2 + a^2)^2}, \quad s > a$	
9. $u_c(t)$ or $u(t-c)$	$\frac{e^{-cs}}{s}$	Sect 6.2
10. $u_c(t)f(t-c)$	$e^{-cs}F(s)$	Sect 6.2
11. $e^{ct}f(t)$	$F(s-c)$	Sect 6.3
12. $f(t) * g(t)$	$F(s)G(s)$	Sect 6.5
13. $\delta(t-c)$	$e^{-cs}$	Sect 6.4
14. $f^{(n)}(t)$	$s^n F(s) - s^{n-1}f(0) - \dots - f^{n-1}(0)$	Sect 6.1
15. $(-t)^n f(t)$	$F^{(n)}(s)$	Sect 6.2

Notes:

$u_c(t)$  is the Heaviside function, and the asterisk (\*) denotes convolution.