TABLE 6.2.1 Elementary Laplace Transforms

$f(t) = \mathcal{L}^{-1}\{F(s)\}$	$F(s) = \mathcal{L}\{f(t)\}\$	Notes
1. 1	$\frac{1}{s}$, $s > 0$	Sec. 6.1; Ex. 4
2. e^{at}	$\frac{1}{s-a}$, $s>a$	Sec. 6.1; Ex. 5
3. t^n , $n = positive integer$	$\frac{n!}{s^{n+1}}, \qquad s > 0$	Sec. 6.1; Prob. 31
4. t^p , $p > -1$	$\frac{\Gamma(p+1)}{s^{p+1}}, \qquad s > 0$	Sec. 6.1; Prob. 31
5. sin <i>at</i>	$\frac{a}{s^2 + a^2}, \qquad s > 0$	Sec. 6.1; Ex. 7
6. cos <i>at</i>	$\frac{s}{s^2 + a^2}, \qquad s > 0$	Sec. 6.1; Prob. 6
7. sinh <i>at</i>	$\frac{a}{s^2 - a^2}, \qquad s > a $	Sec. 6.1; Prob. 8
8. cosh <i>at</i>	$\frac{s}{s^2 - a^2}, \qquad s > a $	Sec. 6.1; Prob. 7
9. $e^{at} \sin bt$	$\frac{b}{(s-a)^2 + b^2}, \qquad s > a$	Sec. 6.1; Prob. 13
10. $e^{at}\cos bt$	$\frac{s-a}{(s-a)^2+b^2}, \qquad s>a$	Sec. 6.1; Prob. 14
11. $t^n e^{at}$, $n = positive integer$	$\frac{n!}{(s-a)^{n+1}}, \qquad s > a$	Sec. 6.1; Prob. 18
12. $u_c(t)$	$\frac{e^{-cs}}{s}, \qquad s > 0$	Sec. 6.3
$13. \ u_c(t)f(t-c)$	$e^{-cs}F(s)$	Sec. 6.3
$14. e^{ct}f(t)$	F(s-c)	Sec. 6.3
15. $f(ct)$	$\frac{1}{c}F\left(\frac{s}{c}\right), \qquad c > 0$	Sec. 6.3; Prob. 25
$16. \int_0^t f(t-\tau)g(\tau) d\tau$	F(s)G(s)	Sec. 6.6
17. $\delta(t-c)$	e^{-cs}	Sec. 6.5
18. $f^{(n)}(t)$	$s^n F(s) - s^{n-1} f(0) - \dots - f^{(n-1)}(0)$	Sec. 6.2; Cor. 6.2.2
$19. \ \ (-t)^n f(t)$	$F^{(n)}(s)$	Sec. 6.2; Prob. 29