

MTH 3311 - Laplace Transforms Table

1. $\mathcal{L} [c] = \frac{c}{s}$ (for an arbitrary constant, c)
2. $\mathcal{L} [t] = \frac{1}{s^2}$
3. $\mathcal{L} [t^2] = \frac{2}{s^3}$
4. $\mathcal{L} [t^3] = \frac{3!}{s^4}$
5. $\mathcal{L} [t^n] = \frac{n!}{s^{n+1}}$ (for $n = 0, 1, 2, 3, \dots$)
6. $\mathcal{L} [ct] = \frac{c}{s^2}$ (for an arbitrary constant c)
7. $\mathcal{L} [ct^n] = \frac{c \cdot n!}{s^{n+1}}$ (for an arbitrary constant c , and for $n = 0, 1, 2, 3, \dots$)
8. $\mathcal{L} [c_1 + c_2t] = \frac{c_1}{s} + \frac{c_2}{s^2}$ (for arbitrary constants, c_1 and c_2)
9. $\mathcal{L} [\cos(ct)] = \frac{s}{s^2+c^2}$ (for an arbitrary constant, c)
10. $\mathcal{L} [\sin(ct)] = \frac{c}{s^2+c^2}$ (for an arbitrary constant, c)
11. $\mathcal{L} [\cosh(kt)] = \frac{s}{s^2-k^2}$; $s > |k|$ (for an arbitrary constant, k)
12. $\mathcal{L} [\sinh(kt)] = \frac{k}{s^2-k^2}$; $s > |k|$ (for an arbitrary constant, k)
13. $\mathcal{L} [e^{kt}] = \frac{1}{s-k}$; $s > k$ (for an arbitrary constant, k)
14. $\mathcal{L} [te^{kt}] = \frac{1}{(s-k)^2}$; $s > k$ (for an arbitrary constant, k)
15. $\mathcal{L} [t^n e^{kt}] = \frac{n!}{(s-k)^{n+1}}$; $s > k$ (for an arbitrary constant, k)
16. $\mathcal{L} [0] = 0$
17. $\mathcal{L} [cf(t)] = cF(s)$
18. $\mathcal{L} [c_1f(t) + c_2g(t)] = c_1F(s) + c_2G(s)$
19. $\mathcal{L} [f'(t)] = sF(s) - f(0)$
20. $\mathcal{L} [f''(t)] = s^2F(s) - sf(0) - f'(0)$
21. $\mathcal{L} [f^{(n)}(t)] = s^n F(s) - s^{n-1}f(0) - s^{n-2}f'(0) - \dots - sf^{(n-2)}(0) - f^{(n-1)}(0)$