DOC BENTON'S FAVORITE LAPLACE TRANSFORMS

1. $L[f(t)] = \int_0^\infty f(t) \cdot e^{-st}\, dt = F(s)$

2. $L[f(t) \pm g(t)] = L[f(t)] \pm L[g(t)]$

3. $L[c \cdot f(t)] = c \cdot L[f(t)]$

4. $L[1] = \dfrac{1}{s} \quad (s > 0)$

5. $L[e^{at}] = \dfrac{1}{s-a} \quad (s > a)$

6. $L\left[\dfrac{dy}{dt}\right] = s \cdot L[y] - y(0)$

7. $L\left[\dfrac{d^2y}{dt^2}\right] = s^2 \cdot L[y] - s \cdot y(0) - y'(0)$

8. $L[u_a(t)] = e^{-as}\dfrac{1}{s} \quad (s > 0)$

9. $L[u_a(t) \cdot f(t-a)] = e^{-as} L[f(t)]$

10. $L[\sin bt] = \dfrac{b}{s^2 + b^2} \quad (s > 0)$

11. $L[\cos bt] = \dfrac{s}{s^2 + b^2} \quad (s > 0)$

12. $L[f(t)] = F(s) \Rightarrow L[e^{at} f(t)] = F(s-a)$

13. $L[e^{at} \sin bt] = \dfrac{b}{(s-a)^2 + b^2} \quad (s > a)$

14. $L[e^{at} \cos bt] = \dfrac{s-a}{(s-a)^2 + b^2} \quad (s > a)$

15. $L[t \cdot \sin bt] = \dfrac{2bs}{(s^2 + b^2)^2} \quad (s > 0)$

16. $L[t \cdot \cos bt] = \dfrac{s^2 - b^2}{(s^2 + b^2)^2} \quad (s > 0)$