

$$1. \mathcal{L}\{1\} = \frac{1}{s}.$$

$$2. \mathcal{L}\{t\} = \frac{1}{s^2}.$$

$$3. \mathcal{L}\{t^n\} = \frac{n!}{s^{n+1}}.$$

$$4. \mathcal{L}\{\sin kt\} = \frac{k}{s^2 + k^2}.$$

$$5. \mathcal{L}\{\cos kt\} = \frac{s}{s^2 + k^2}.$$

$$6. * \mathcal{L}\{\sin^2 kt\} = \frac{2k^2}{s(s^2 + 4k^2)}.$$

$$7. * \mathcal{L}\{\cos^2 kt\} = \frac{s^2 + 2k^2}{s(s^2 + 4k^2)}.$$

$$8. \mathcal{L}\{e^{at}\} = \frac{1}{s - a}.$$

$$9. * \mathcal{L}\{te^{at}\} = \frac{1}{(s - a)^2}.$$

$$10. * \mathcal{L}\{t^n e^{at}\} = \frac{n!}{(s - a)^{n+1}}.$$

$$11. * \mathcal{L}\{e^{at} \sin kt\} = \frac{k}{(s - a)^2 + k^2}.$$

$$12. * \mathcal{L}\{e^{at} \cos kt\} = \frac{s - a}{(s - a)^2 + k^2}.$$

$$13. \mathcal{L}\{e^{at} f(t)\} = F(s - a).$$

$$14. \mathcal{L}\{\mathcal{U}(t - a)\} = \frac{e^{-as}}{s}.$$

$$15. \mathcal{L}\{f(t - a)\mathcal{U}(t - a)\} = e^{-as} F(s).$$

$$16. \mathcal{L}\{f(t)\mathcal{U}(t - a)\} = e^{-as} \mathcal{L}\{f(t + a)\}.$$

$$17. \mathcal{L}\{f^{(n)}(t)\} = s^n F(s) - s^{n-1} f(0) - s^{n-2} f'(0) - s^{n-3} f''(0) - \dots - f^{(n-1)}(0).$$

$$18. \mathcal{L}\{t^n f(t)\} = (-1)^n \frac{d^n}{ds^n} F(s).$$

19. $\mathcal{L}\left\{\int_0^t f(\tau)g(t-\tau)d\tau\right\} = F(s)G(s).$

20. $\mathcal{L}\{\delta(t)\} = 1.$

21. $\mathcal{L}\{\delta(t-t_0)\} = e^{-st_0}.$