| | | |
|---|---|---|
| Integral definition of $\mathcal{L}\{f(t)\}$ | $\mathcal{L}\{1\}$ | $\mathcal{L}\{t\}$ |
| $\mathcal{L}\{t^n\}, \quad n = 1, 2, 3, \ldots$ | $\mathcal{L}\{e^{at}\}$ | $\mathcal{L}\{\sin kt\}$ |
| $\mathcal{L}\{\cos kt\}$ | $\mathcal{L}\{\sinh kt\}$ | $\mathcal{L}\{\cosh kt\}$ |

| | | |
|---|---|---|
| $\dfrac{1}{s^2}$ | $\dfrac{1}{s}$ | $\displaystyle\int_0^\infty e^{-st} f(t)\,dt$ |
| $\dfrac{k}{s^2+k^2}$ | $\dfrac{1}{s-a}$ | $\dfrac{n!}{s^{n+1}}, \quad n = 1, 2, 3, \ldots$ |
| $\dfrac{s}{s^2-k^2}$ | $\dfrac{k}{s^2-k^2}$ | $\dfrac{s}{s^2+k^2}$ |

| | | |
|---|---|---|
| $\mathcal{L}^{-1}\left\{\frac{1}{s}\right\}$ | $\mathcal{L}^{-1}\left\{\frac{1}{s^2}\right\}$ | $\mathcal{L}^{-1}\left\{\frac{n!}{s^{n+1}}\right\}$, $n = 1, 2, 3, \ldots$ |
| $\mathcal{L}^{-1}\left\{\frac{1}{s-a}\right\}$ | $\mathcal{L}^{-1}\left\{\frac{k}{s^2+k^2}\right\}$ | $\mathcal{L}^{-1}\left\{\frac{s}{s^2+k^2}\right\}$ |
| $\mathcal{L}^{-1}\left\{\frac{k}{s^2-k^2}\right\}$ | $\mathcal{L}^{-1}\left\{\frac{s}{s^2-k^2}\right\}$ | $\mathcal{L}\{f'(t)\}$ |

| | | |
|---|---|---|
| $t^n, n = 1, 2, 3, \ldots$ | $t$ | $1$ |
| $\cos kt$ | $\sin kt$ | $e^{at}$ |
| $s\,F(s) - f(0)$ | $\cosh kt$ | $\sinh kt$ |

| | | |
|---|---|---|
| $\mathcal{L}\{f''(t)\}$ | $\mathcal{L}\{e^{at}f(t)\}$ | Piecewise definition of $\mathscr{U}(t-a)$ |
| Graph of $\mathscr{U}(t-a)$ | $f(t) = \begin{cases} 0, & 0 \le t < a, \\ g(t), & a \le t < b, \\ 0, & b \le t. \end{cases}$ | $\mathcal{L}\{\mathscr{U}(t-a)\}$ |
| $\mathcal{L}\{f(t-a)\,\mathscr{U}(t-a)\}$ | $\mathcal{L}\{g(t)\,\mathscr{U}(t-a)\}$ | Integral definition of $f * g$ |

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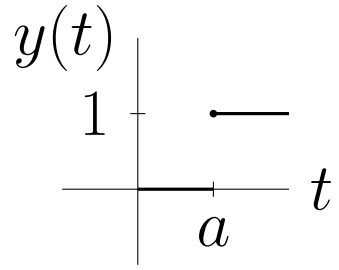
|---|---|---|
| $\mathscr{U}(t-a) = \begin{cases} 0, & 0 \le t < a \\ 1, & t \ge a. \end{cases}$ | $F(s-a)$ | $s^2F(s) - s\,f(0) - f'(0)$ |
| $\dfrac{e^{-as}}{s}$ | $f(t) = g(t)\Big[\mathscr{U}(t-a) - \mathscr{U}(t-b)\Big]$ |   |
| $\displaystyle\int_0^t f(\tau)\,g(t-\tau)\,d\tau$ | $e^{-as}\mathcal{L}\{g(t+a)\}$ | $e^{-as}F(s)$ |

| | | |
|---|---|---|
| $\mathcal{L}\{f * g\}$ | | |
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|---|---|---|
| | | $F(s)\,G(s)$ |
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