Complementos de Análise Matemática

Formulário

$L\{f(t)\} = \int_0^\infty f(t)e^{-st}dt$ $\quad$ $L\{1\} = \frac{1}{s}$ $\quad$ $L\{t^n\} = \frac{n!}{s^{n+1}}$

$L\{\text{sen}\, bt\} = \frac{b}{s^2+b^2}$ $\quad$ $L\{\cos bt\} = \frac{s}{s^2+b^2}$ $\quad$ $L\{e^{at}\} = \frac{1}{s-a}$

$L\{\text{senh}\, bt\} = \frac{b}{s^2-b^2}$ $\quad$ $L\{\cosh bt\} = \frac{s}{s^2-b^2}$ $\quad$ $L\{t^n e^{at}\} = \frac{n!}{(s-a)^{n+1}}$

$L\{t\,\text{sen}\, bt\} = \frac{2bs}{(s^2+b^2)^2}$ $\quad$ $L\{t\cos bt\} = \frac{s^2-b^2}{(s^2+b^2)^2}$ $\quad$ $L\{f(t)e^{at}\} = F(s-a)$

$L\{e^{at}\,\text{sen}\, bt\} = \frac{b}{(s-a)^2+b^2}$ $\quad$ $L\{e^{at}\cos bt\} = \frac{s-a}{(s-a)^2+b^2}$ $\quad$ $L\{f(t)t^n\} = (-1)^n \frac{d^n F(s)}{ds^n}$

$L\{e^{at}\,\text{senh}\, bt\} = \frac{b}{(s-a)^2-b^2}$ $\quad$ $L\{e^{at}\cosh bt\} = \frac{s-a}{(s-a)^2-b^2}$ $\quad$ $L\{u_a(t)\} = \frac{e^{-as}}{s}$

$L\{u_a(t)f(t-a)\} = e^{-as}F(s)$ $\quad$ $L\{f^{(n)}(t)\} = s^n L\{f(t)\} - s^{n-1}f(0) - s^{n-2}f'(0) - \ldots - f^{(n-1)}(0)$

$L\{f(t)\} = \frac{\int_0^p e^{-st} f(t)dt}{1-e^{-ps}}$, f periódica com período p $\quad$ $L\left\{\int_0^t f(t)\,dt\right\} = \frac{F(s)}{s}$

$L^{-1}\{sF(s) - f(0)\} = f'(t)$ $\quad$ $L^{-1}\left\{\frac{F(s)}{s}\right\} = \int_0^t f(u)du$ $\quad$ $L^{-1}\{F(s-a)\} = f(t)e^{at}$

$L^{-1}\{F(ks)\} = \frac{1}{k} f\left(\frac{t}{k}\right)$ $\quad$ $L^{-1}\{e^{-as}F(s)\} = u_a(t)f(t-a)$ $\quad$ $L^{-1}\left\{\frac{1}{(s-a)^{n+1}}\right\} = \frac{t^n e^{at}}{n!}$

$f(t) * g(t) = \int_0^t f(x)g(t-x)dx$ $\quad$ $L\{f(t) * g(t)\} = L\{f(t)\}L\{g(t)\}$

$$f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty}\left[a_n \cos\frac{n\pi x}{l} + b_n\,\text{sen}\,\frac{n\pi x}{l}\right];\ a_n = \frac{1}{l}\int_{-l}^{l} f(x)\cos\frac{n\pi x}{l}dx;\ b_n = \frac{1}{l}\int_{-l}^{l} f(x)\,\text{sen}\,\frac{n\pi x}{l}dx$$

$$f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos\frac{n\pi x}{l};\ a_n = \frac{2}{l}\int_0^l f(x)\cos\frac{n\pi x}{l}dx$$

$$f(x) = \sum_{n=1}^{\infty} b_n\,\text{sen}\,\frac{n\pi x}{l};\ b_n = \frac{2}{l}\int_0^l f(x)\,\text{sen}\,\frac{n\pi x}{l}dx$$