

Table (1): Some Useful Basic Mathematical Formulas

Calculus	Trigonometry
<p> <input checked="" type="checkbox"/> odd function x odd function = even function even function x even function = even function odd function x even function = odd function </p> <p> <input checked="" type="checkbox"/> \int_{-a}^a odd function = Zero </p> <p> <input checked="" type="checkbox"/> \int_{-a}^a even function = $2 \int_0^a$ even function </p> <p> <input checked="" type="checkbox"/> $\int e^{-ax} dx = \frac{e^{-ax}}{-a}$ </p> <p> <input checked="" type="checkbox"/> $\int g'(x) e^{g(x)} dx = e^{g(x)}$ </p> <p> <input checked="" type="checkbox"/> $\int_{-\infty}^{\infty} e^{-ax^2} dx = \sqrt{\frac{\pi}{a}}$ </p> <p> <input checked="" type="checkbox"/> $\int_0^{\infty} e^{-ax^2} dx = \frac{1}{2} \sqrt{\frac{\pi}{a}}$ </p> <p> <input checked="" type="checkbox"/> $\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right) + c$ </p> <p> <input checked="" type="checkbox"/> $\int_0^{\infty} \frac{x^{m-1}}{1+x^l} dx = \frac{\pi}{l \sin(\pi \cdot \frac{m}{l})} ; l > m > 0$ </p>	<p> <input checked="" type="checkbox"/> $H(f) ^2 = H(f) \times H^*(f)$ </p> <p> <input checked="" type="checkbox"/> $\cos(a) \cos(b) = \frac{1}{2} [\cos(a-b) + \cos(a+b)]$ If $a = b$, then $\cos^2(a) = \frac{1}{2} [1 + \cos(2b)]$ </p> <p> <input checked="" type="checkbox"/> $\sin(a) \sin(b) = \frac{1}{2} [\cos(a-b) - \cos(a+b)]$ If $a = b$, then $\sin^2(a) = \frac{1}{2} [1 - \cos(2a)]$ </p> <p> <input checked="" type="checkbox"/> $\sin(a) \cos(b) = \frac{1}{2} [\sin(a-b) + \sin(a+b)]$ </p>
	Special Functions
	<p> <input checked="" type="checkbox"/> $u(t-t_0) = \begin{cases} 1 & t \geq t_0 \\ 0 & \text{Otherwise} \end{cases}$ </p> <p> <input checked="" type="checkbox"/> $\delta(t-t_0) = \begin{cases} \infty & t = t_0 \\ 0 & \text{Otherwise} \end{cases}$ </p> <p> <input checked="" type="checkbox"/> $\int_{-\infty}^{\infty} \delta(t-t_0) dt = 1$ </p> <p> <input checked="" type="checkbox"/> $g(t) \delta(t-t_0) = g(t_0) \delta(t-t_0)$ </p> <p> <input checked="" type="checkbox"/> $g(t) \otimes \delta(t-t_0) = g(t-t_0)$ </p>