# Transform Tables

- List of Integral / Space Transforms
- Fourier Analysis

# Useful Equations

| | |
|---|---|
| **Eulers Formula** | $$e^{jx}=\cos(x)+j\sin(x)$$ |
| **Angular Frequency** | $$\omega = 2\pi f$$ |
| **Period** | $$T = \frac{1}{f}$$ |

# Common Integrals

| |
|---|
| $$\int\,u\,dv = uv-\int\,v\,du$$ |
| $$\int\,\frac{1}{ax+b}\,dx = \frac{1}{a}ln(ax+b)$$ |
| $$\int\,\sin(x)\,dx = -\cos(x)$$ |
| $$\int\,\cos(x)\,dx = \sin(x)$$ |
| $$\int\,e^{ax}\,dx = \frac{1}{a}e^{ax}$$ |
| $$\int\,xe^x\,dx = (x-1)e^x$$ |

# Common Derivatives

| |
|---|
| $$\frac{d}{dx}(f(x)g(x)) = f(x)\dot{g}(x) + \dot{f}(x)g(x)$$ |
| $$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{f(x)\dot{g}(x)-\dot{f}(x)g(x)}{(g(x))^2}$$ |
| $$\frac{d}{dx}(\sin(x)) = \cos(x) $$ |
| $$\frac{d}{dx}(\cos(x)) = -\sin(x) $$ |
| $$\frac{d}{dx}(\tan(x)) = \sec^2(x) $$ |
| $$\frac{d}{dx}(\sin^{-1}(x)) = \frac{1}{\sqrt{1-x^2}}$$ |
| $$\frac{d}{dx}(\cos^{-1}(x)) = \frac{-1}{\sqrt{1-x^2}}$$ |
| $$\frac{d}{dx}(\tan^{-1}(x)) = \frac{1}{1+x^2}$$ |
| $$\frac{d}{dx}(a^x) = a^x\ln(a)$$ |
| $$\frac{d}{dx}(\ln\|x\|) = \frac{1}{x}$$ |
| $$\frac{d}{dx}(\log_a(x)) = \frac{1}{x\ln(a)}$$ |