$$\begin{cases} Q = R\sqrt{C/L} \\ f_0 = (2\pi\sqrt{LC})^{-1} \end{cases}, \quad H(\omega) = V_{out}(\omega)/V_{in}(\omega) = z_p/z_i,$$

$$Q(k) = \frac{1}{\sqrt{2\pi}}\int_k^{\infty} \exp\left(-\frac{\lambda^2}{2}\right)d\lambda \quad \lambda = (m-x)/\sigma \Rightarrow Q(k) = \frac{1}{\sqrt{2\pi}}\int_{\sigma k+m}^{\infty} \exp\left(-\frac{(x-m)^2}{2\sigma^2}\right)dx$$

$$\begin{cases} P = UI = U^2/R = I^2R \\ R = U/I \end{cases}, \quad \frac{V_g}{V_i} = \frac{Z_g + Z_L}{Z_L}, P_L = V_i I_i \cos\theta$$

$$\cos\theta = R_{tot}/Z_{tot} = R_{tot}/\sqrt{R_{tot}^{\ 2} + X_{tot}^2}, X_{tot} = X_g + X_L, R_{tot} = R_L + R_g$$

$$N_{D(PM)} = \int_{-W}^{W} \frac{\eta}{2S_R} df = \frac{\eta W}{S_R}, \quad N_{D(FM)} = \int_{-W}^{W} \frac{\eta f^2}{2S_R} df = \frac{\eta W^3}{3S_R}$$

$$S_D/N_D\big|_{FM} = \frac{f_\Delta^2 S_x}{\eta W^3/(3S_R)} = 3\underbrace{\left(\frac{f_\Delta}{W}\right)}_{D}^2 S_x \underbrace{\frac{S_R}{\eta W}}_{\gamma} = 3D^2 S_x\gamma, \quad S_D/N_D\big|_{FM,D>>1} = \frac{3}{4}\left(\frac{B_T}{W}\right)^2 S_x\gamma$$

$$S_D/N_D\big|_{PM} = \frac{\phi_\Delta^2 S_x}{\eta W/S_R} = \phi_\Delta^2 S_x\gamma, \text{where } \phi_\Delta^2 S_x \le \pi^2$$

$$\begin{cases} \int \frac{1}{1+x^2}dx = \arctan(x) \\ \int \frac{x^2}{1+x^2}dx = x - \arctan(x) \end{cases} \quad \begin{cases} \Pi\left(\frac{t}{\tau}\right) \leftrightarrow \tau \operatorname{sinc} f\tau \\ \Lambda\left(\frac{t}{\tau}\right) \leftrightarrow \tau \operatorname{sinc}^2 f\tau \end{cases} \quad \begin{cases} \frac{d^n v(t)}{dt^n} \leftrightarrow (j2\pi f)^n V(f) \\ \int_{-\infty}^{t} v(\lambda)d\lambda \leftrightarrow \frac{1}{j2\pi f}V(f) + \frac{1}{2}V(0)\delta(f) \end{cases}$$

$$\begin{cases} \sin\alpha\sin\beta = 1/2\cos(\alpha-\beta) - 1/2\cos(\alpha+\beta) \\ \cos\alpha\cos\beta = 1/2\cos(\alpha-\beta) + 1/2\cos(\alpha+\beta) \\ \sin\alpha\cos\beta = 1/2\sin(\alpha-\beta) + 1/2\sin(\alpha+\beta) \end{cases}, \quad \begin{cases} \cos^2\alpha = (1+\cos 2\alpha)/2 \\ \cos^3\alpha = (3\cos\alpha + \cos 3\alpha)/4 \end{cases}$$

$$\begin{cases} (\alpha+\beta)^2 = \alpha^2 + 2\alpha\beta + \beta^2 \\ (\alpha+\beta)^3 = \alpha^3 + 3\alpha^2\beta + 3\alpha\beta^2 + \beta^3 \end{cases}$$