

$c = 3 \times 10^8$  m/s (in free space),  $c = 2 \times 10^8$  m/s (in media),  $1 \text{ km} = 10^3$  m,  $1 \text{ ms} = 10^{-3}$  s,  $1 \text{ Mb} = 10^6$  b

$$\log_x y = \frac{\log_a y}{\log_a x}$$

$$C = W_c \log_2(1 + \text{SNR})$$

$$y = \int_a^b x dx = \left. \frac{x^2}{2} \right|_a^b = (b^2 - a^2)/2, y = \int_a^b x^2 dx = \left. \frac{x^3}{3} \right|_a^b = (b^3 - a^3)/3$$

$$y(t) = a_0 + \sum_{k=1}^{\infty} a_k \cos(2\pi f_0 \cdot k \cdot t) + \sum_{k=1}^{\infty} b_k \sin(2\pi f_0 \cdot k \cdot t)$$

$$f_0 = \frac{1}{T}, a_0 = \frac{1}{T} \int_0^T y(t) dt, a_k = \frac{2}{T} \int_0^T y(t) \cdot \cos(2\pi f_0 \cdot k \cdot t) dt, b_k = \frac{2}{T} \int_0^T y(t) \cdot \sin(2\pi f_0 \cdot k \cdot t) dt$$

$$\text{SNR [dB]} = 10 \log(\text{SNR}), \text{SNR [dB]} = 6m - 7.2$$

$$\mathcal{F}\{\text{rect}(t/T)\} = T \text{sinc}(fT) = T \sin(\pi fT) / \pi fT$$

$$\mathcal{F}\{\text{sinc}(t/T)\} = T \text{rect}(fT)$$