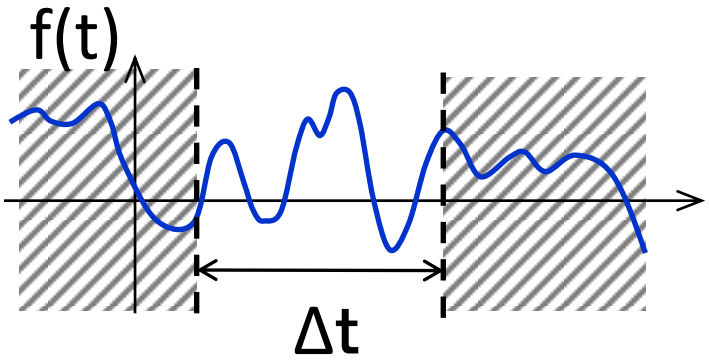
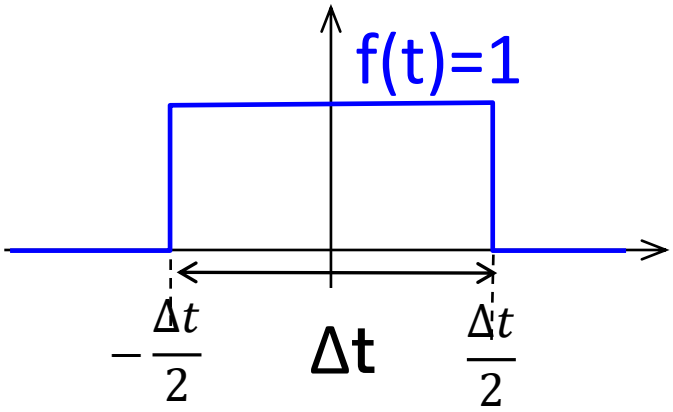


$$G(f) = \int_{-\infty}^{\infty} f(t) e^{-i2\pi f t}\, dt$$



$$G(f) = \int_{-\frac{\Delta t}{2}}^{\frac{\Delta t}{2}} 1 \cdot e^{-i2\pi f t}\, dt = \left[\frac{-1}{i2\pi f} \cdot e^{-i2\pi f t} \right]_{-\frac{\Delta t}{2}}^{\frac{\Delta t}{2}}$$

$$= \frac{-1}{i2\pi f} \left(e^{-i2\pi f \frac{\Delta t}{2}} - e^{-i2\pi f \left(-\frac{\Delta t}{2}\right)} \right) = \frac{1}{i2\pi f} \left(e^{i\pi f \Delta t} - e^{-i\pi f \Delta t} \right)$$

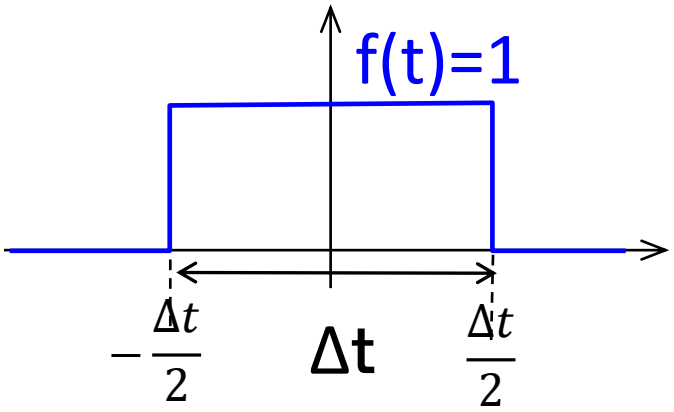
$$= \frac{1}{\pi f} \sin \pi f \Delta t$$

$$\theta = \pi f \Delta t \qquad \sin\theta = \frac{e^{i\theta} - e^{-i\theta}}{2i}$$

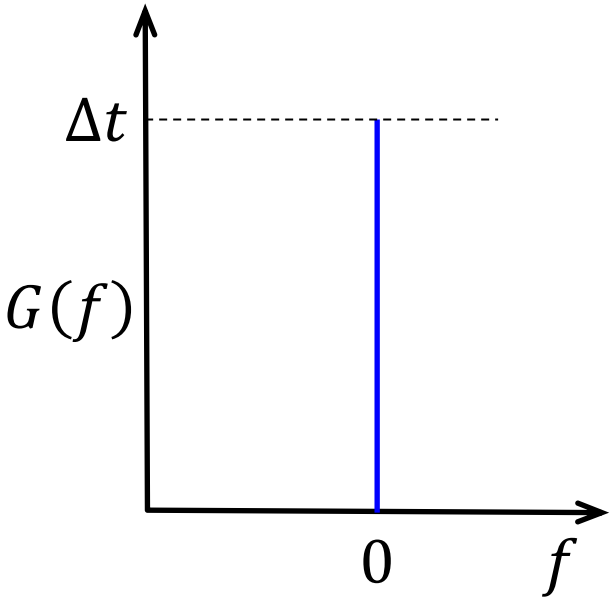
$$G(f) = \frac{1}{\pi f}\sin \pi f \Delta t$$

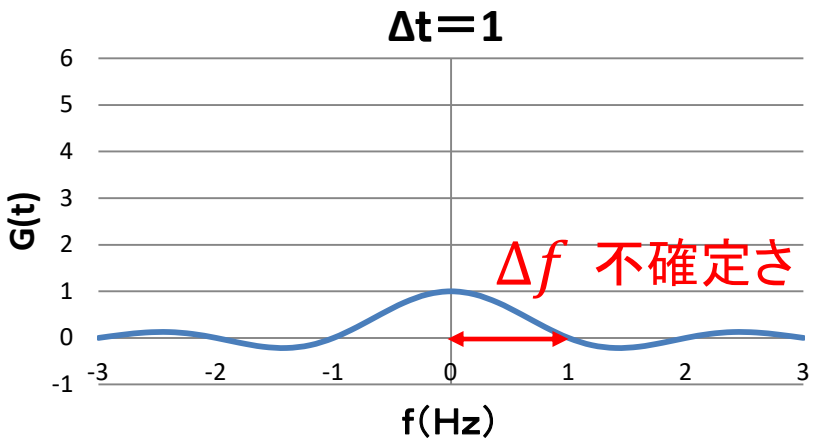
$$= \frac{\sin \pi f \Delta t}{\pi f \Delta t} \cdot \Delta t$$

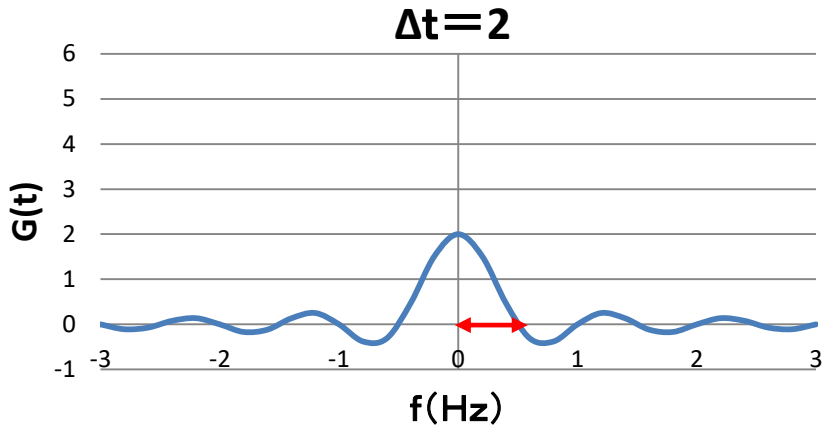
$\frac{\sin \pi f \Delta t}{\pi f \Delta t} \to 1$ ⇐ $\lim_{\theta \to 0} \frac{\sin \theta}{\theta} = 1$

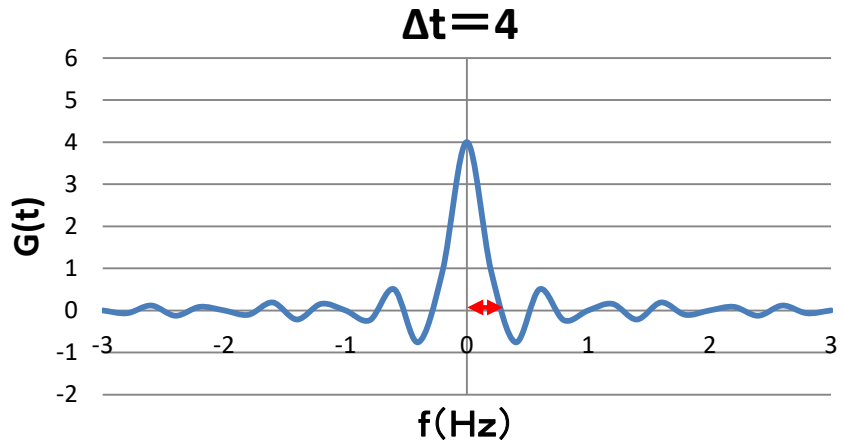


$f = 0$のとき$G(f) = \Delta t$









$f = 0$のとき$G(f) = \Delta t$