

Dagens teman

- Integraler av harmoniska funktioner (F 7.1)
- Faltning (7.2)
- Fouriertransformen (7.3)

Sinus cardinalis:

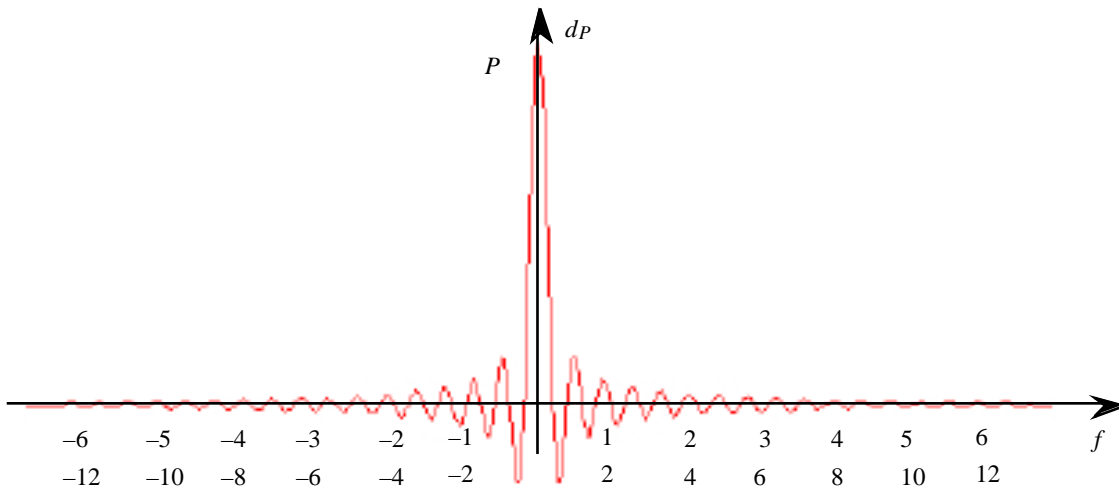
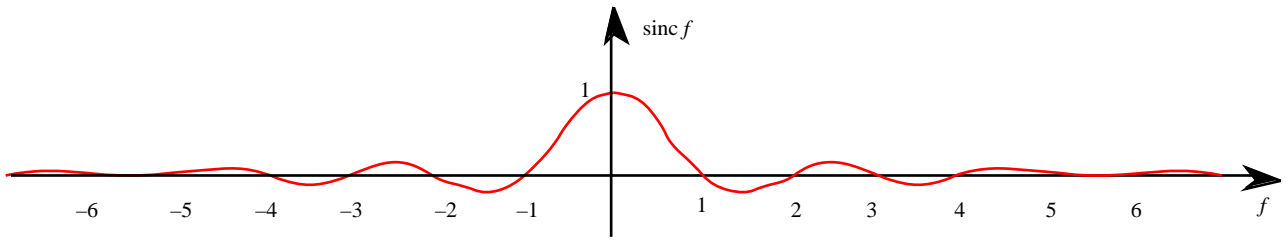
$$\bullet \int_{-P/2}^{P/2} e^{jft} df = \frac{\sin P f}{f} = P \operatorname{sinc} Pf,$$

$$\bullet \int_{-P/2}^{P/2} e^{j t d} d = \frac{\sin P /2}{/2} = P \operatorname{sinc} P \frac{t}{2}$$

-pulsen som summa av alla harmoniska signaler:

$$\bullet \int_{-} e^{jft} df = (t),$$

$$\bullet \int_{-} e^{j t d} d = 2 (t),$$



Fouriertransformen

Syntesekvationen:

$$x(t) = \frac{1}{2\pi} \int_{-\infty}^{\infty} X(\omega) e^{j\omega t} d\omega$$

Analysekvationen:

$$X(\omega) = \int_{-\infty}^{\infty} x(t) e^{-j\omega t} dt$$

Parsevals formel:

$$\int_{-\infty}^{\infty} |x(t)|^2 dt = \frac{1}{2\pi} \int_{-\infty}^{\infty} |X(\omega)|^2 d\omega$$

Egenskaper hos faltning

$$(x*y)(t) = \int_{-\infty}^{\infty} x(\tau) y(t-\tau) d\tau.$$

$$x * y = y * x.$$

$$x * \delta(t) = x.$$

$$x * \delta'(t) = x'(t), \quad x * \delta^{(p)}(t) = x^{(p)}(t)$$

$$x * (a_1 y_1 + a_2 y_2) = a_1 (x * y_1) + a_2 (x * y_2)$$

$$x * \sum_n a_n y_n = \sum_n a_n (x * y_n).$$

$$x(t) * \int_{-\infty}^{\infty} y(t,f) df = \int_{-\infty}^{\infty} x(t) * y(t,f) df$$

$$(x*y)*z = x*(y*z).$$