Decomposition theorem

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Vector decomposition: discrete form:

$$(a,b,c) = a(1,0,0) + b(0,1,0) + c(0,0,1)$$

Function decomposition: discrete form:

any time function, $f(t)$, with a period $2p$, we have

$$f(t) = \sum\{a_n cos(\frac{n\pi t}{p}) + b_n sin(\frac{n\pi t}{p})\}$$

where $\omega_n = \frac{n\pi}{p}$.

any space function, $f(x)$, with a wave length 2λ, we have

$$f(x) = \sum\{a_n cos(\frac{n\pi x}{\lambda}) + b_n sin(\frac{n\pi x}{\lambda})\}$$

where $k_n = \frac{n\pi}{\lambda}$.

Function decomposition: continuous form:

any time function, $f(t)$, we have

Fourier transform:

$$F(\omega) = \int_{-\infty}^{\infty} f(t) e^{-i\omega t} d\omega$$

Inverse Fourier transform:

$$f(t) = \frac{1}{2\pi} \int_{-\infty}^{\infty} F(\omega) e^{i\omega t} d\omega$$

【存檔：c:/ctex/course/math2/decomp1.te】【建檔:Mar./3/'97】