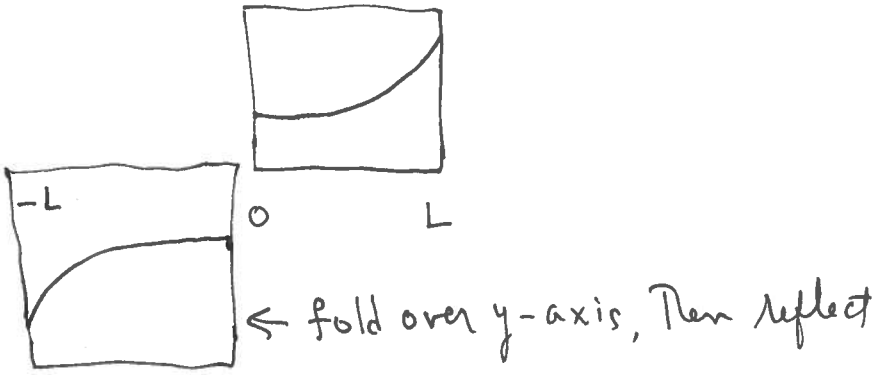
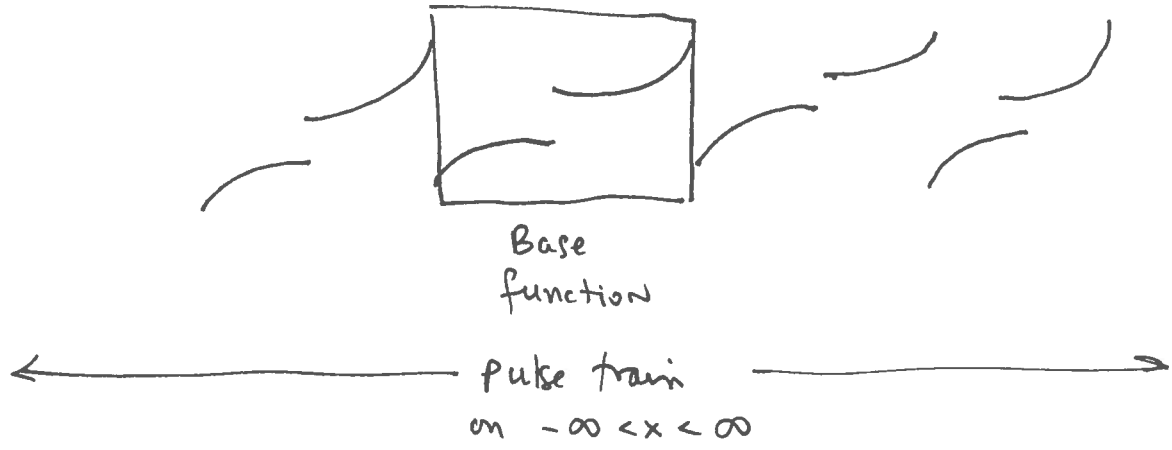
The Fourier Sine Series of $f(x)$, defined only on $0 < x < L$, is a pulse train on $(-\infty, \infty)$ whose base function on $-L < x < L$ is an odd function:

$$\text{Base function on } -L<x<L = \begin{cases} f(x) & 0<x<L \\ -f(-x) & -L<x<0 \end{cases}$$

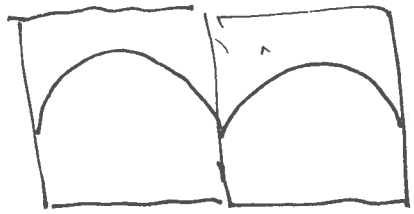




Example: $f(x) = 100$ on $0 < x < L$

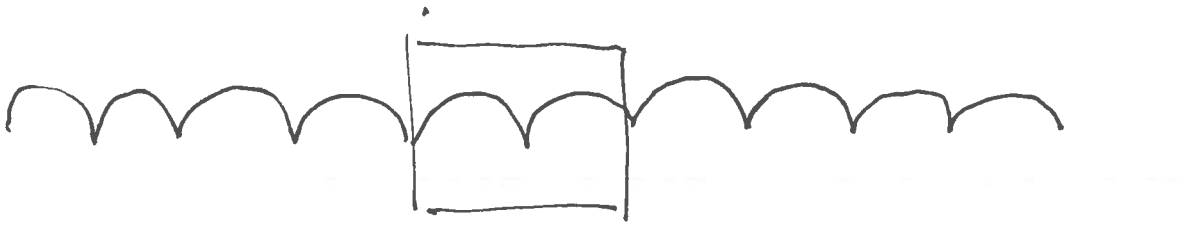
$$\text{Base function} = \begin{cases} 100 & 0<x<L \\ -100 & -L<x<0 \end{cases}$$

The Fourier cosine series of $f(x)$, defined only on $0 < x < L$, is a pulse train on $(-\infty, \infty)$ whose base function on $|x| < L$ is an even function



fold over the y-axis

Base function $= \begin{cases} f(x) & 0 < x < L \\ f(-x) & -L < x < 0 \end{cases}$ = even function



Base function is even

pulse train on $-\infty < x < \infty$

Example: $f(x) = 100$ on $0 < x < L$

Base function $= \begin{cases} 100 & 0 < x < L \\ 100 & -L < x < 0 \end{cases}$