Signal	BW (rads)	BW f
$\text{sinc}(\omega t)$	ω	$\omega/2\pi$
$\text{sinc}^2(\omega t)$	2ω	$2\omega/2\pi$
$\text{sinc}(\omega t)\cdot\text{sinc}(\alpha t)$	$\omega+\alpha$	$\frac{\omega+\alpha}{2\pi}$

← Convolution of two rectangles

single freq $\sin(At)$ —Fourier→ $\delta(\omega-A)$

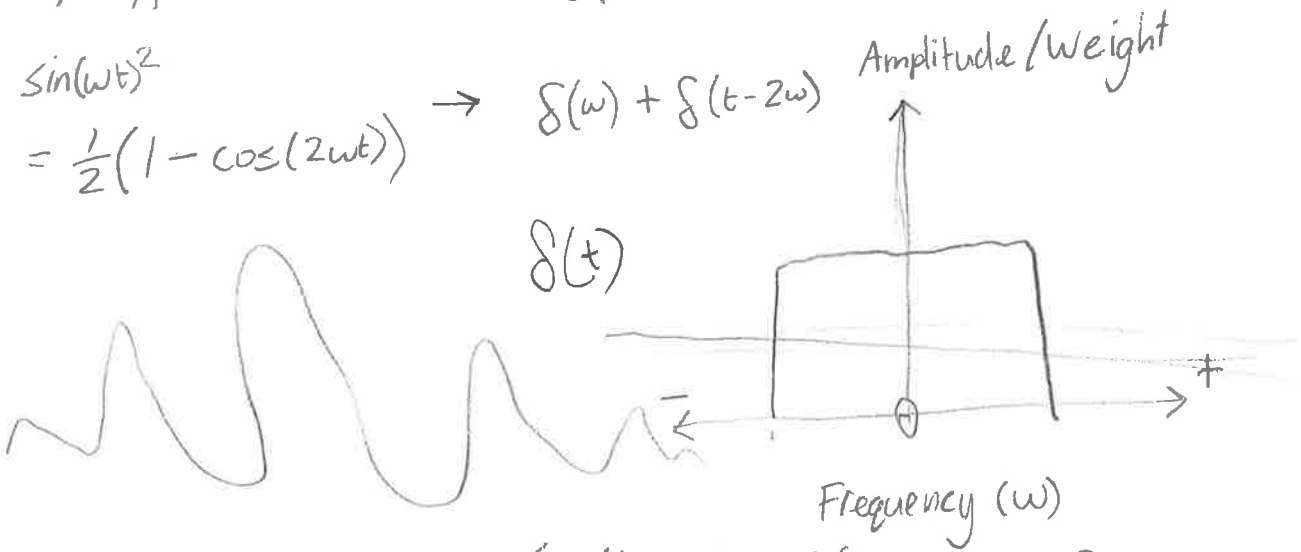
multiple freq $\sin(At)+\sin(Bt)$ $\quad \delta(\omega-A)+\delta(\omega-B)$

$A\cos(0\cdot t) \rightarrow A \rightarrow \delta(\omega)$

$\sin(\omega t)^2 = \frac{1}{2}(1-\cos(2\omega t)) \rightarrow \delta(\omega)+\delta(t-2\omega)$

$\text{sinc}(100\pi t)$

$2 \times 100\pi = N_f$



$\text{sinc}(100\pi t) \times \text{sinc}(100\pi t)$ $\quad \text{sinc}^2(100\pi t)$

Sinc → Different Looking for bandwidth, range of frequencies.

$\text{sinc}(100\pi t)$ → 100π ✗

$F(\text{sinc}(\omega t)) \rightarrow \text{rect}(\omega)$ ← clearly bandlimited

Bandlimited ∴ Nyquist

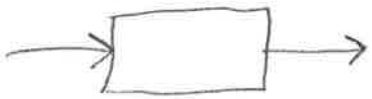
Anti-aliasing filters bandlimit signals

Q4.

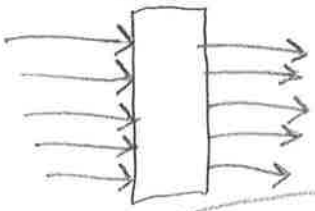
$[0,1,0,1,0] \longrightarrow [2,1,0,3,2]$

Input	Output
α	$f(\alpha)$
β	$f(\beta)$
γ	$f(\gamma)$

SISO



MIMO



$f(\alpha+\beta) = f(\alpha)+f(\beta)$??

$[0,1,0,1,0] \longrightarrow [2,1,0,3,2]$

$f(t) = 0$ Linear? Invertible?