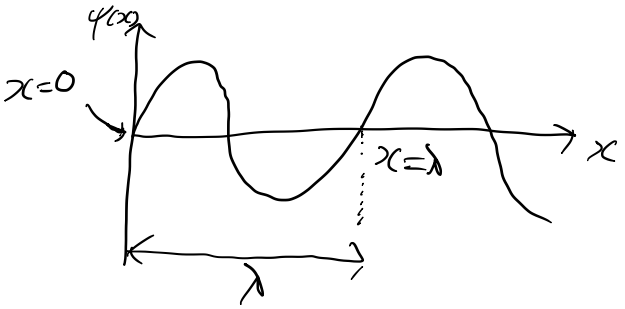
# de Broglie Wavelength

Let $\psi(x) = \sin\left(\frac{px}{\hbar}\right)$




1 period when

$$\frac{px}{\hbar} = 2\pi$$

$$\frac{p\lambda}{\hbar} = 2\pi$$

$$\hbar = \frac{h}{2\pi}$$

$$\frac{p\lambda}{h} = 1$$

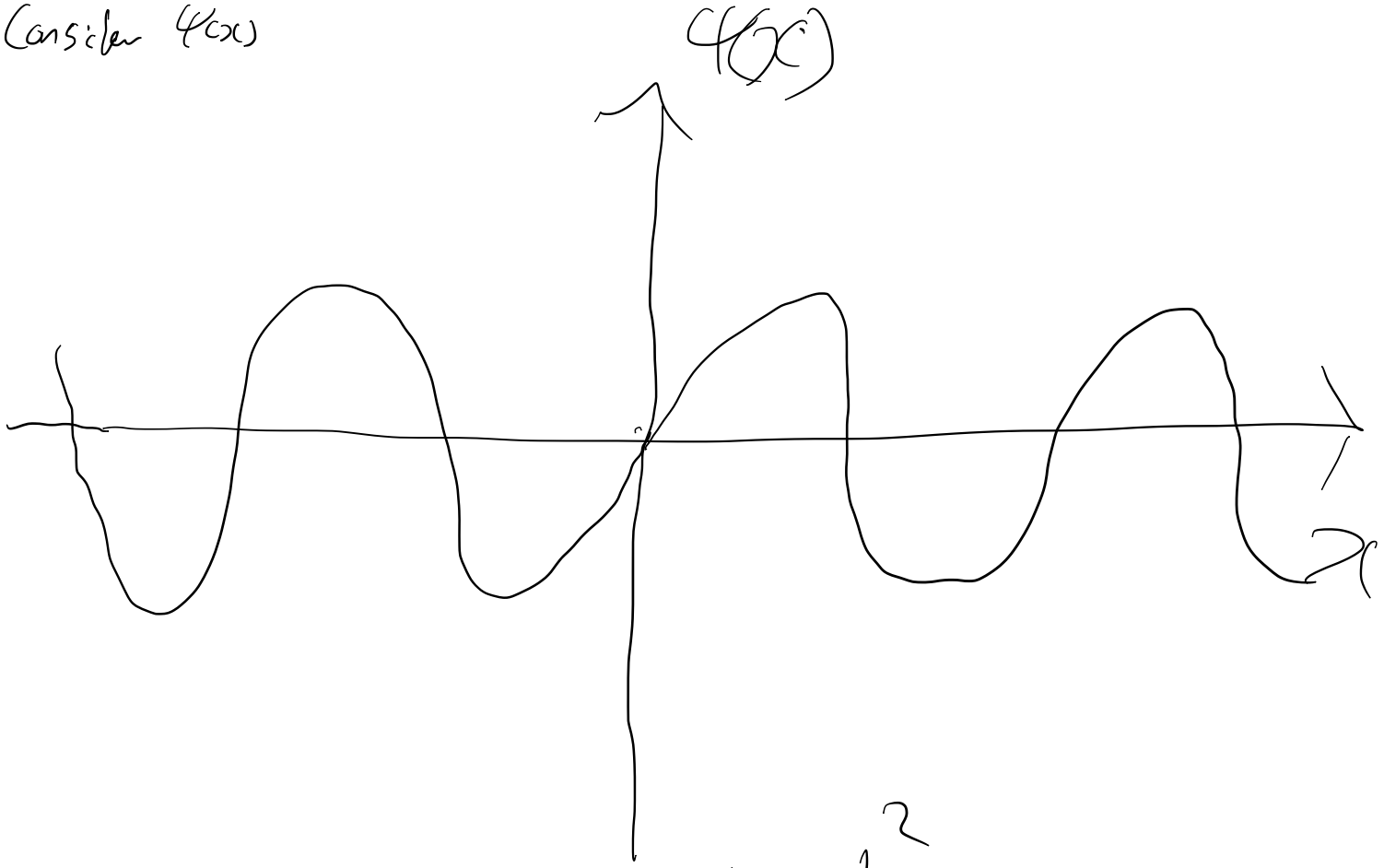
$$\lambda = \frac{h}{p}$$

# de Broglie Normalisation

$$\psi(x) = \sin\left(\frac{px}{\hbar}\right)$$

$$\int_{-\infty}^{\infty} |\psi(x)|^2 dx = \int_{-\infty}^{\infty} \sin^2\left(\frac{px}{\hbar}\right) dx$$

Consider $\psi(x)$





$$\int |\psi(x)|^2 dx = \infty$$

$$N = \frac{1}{\sqrt{\infty}}$$

So this waveform can not be normalised!