

$$\begin{aligned}
 \frac{d^2\psi(x)}{dx^2} &= \frac{d}{dx} \frac{d\psi(x)}{dx} \\
 &= \frac{d}{dx} \lim_{dx \rightarrow 0} \frac{\psi(x+dx) - \psi(x)}{dx} \\
 &= \lim_{dx \rightarrow 0} \frac{\frac{\psi(x+dx+dx) - \psi(x+dx)}{dx} - \frac{\psi(x+dx) - \psi(x)}{dx}}{dx} \\
 &= \lim_{dx \rightarrow 0} \frac{\frac{\psi(x+dx) - \psi(x)}{dx} - \frac{\psi(x) - \psi(x-dx)}{dx}}{dx} \\
 &= \lim_{dx \rightarrow 0} \frac{\psi(x+dx) - 2\psi(x) + \psi(x-dx)}{dx^2}
 \end{aligned}$$