(8a)

Now suppose that the initial conditions are such that

Const = zero

$$\Rightarrow \quad \ln \phi(t) = -i \frac{c}{\hbar} t$$

$$\phi(t) = \exp\left(-i \frac{c}{\hbar} t\right)$$

Comparing this with a general complex wavefunction

$$\phi(t) = \exp(-i\omega t)$$

$$\Rightarrow \quad \frac{c}{\hbar} = \omega$$

$$\boxed{c = \hbar\omega = E}$$

$\Rightarrow$ The time independent equation can be written as

$$-\frac{\hbar^2}{2m} \frac{1}{\psi} \frac{\partial^2 \psi}{\partial x^2} + V(x) = E$$

or

$$\boxed{-\frac{\hbar^2}{2m} \frac{\partial^2 \psi}{\partial x^2} + (V(x) - E)\psi(x) = 0}$$

and time-dependent will be in this form.

$$\boxed{i\hbar \frac{\partial \phi}{\partial t} = E\phi}$$

Examples: 3.5,

Solved Problems: 3.3, 3.6, 3.7, 3.8, 3.9, 3.10

Exercise: 3.26