

r space

m space

A) $\psi(t) = e^{-i\omega t}$

$\rightarrow$

$$\psi_1(t_1) = e^{-i\omega t_1}$$

$\downarrow$

$$\frac{\partial \psi_1(t_1)}{\partial t_1} = -i\omega e^{-i\omega t_1}$$

$$\frac{1}{\sqrt{m(r)}} \frac{\partial \psi_1(t)}{\partial t} = -i\omega e^{-i\omega \sqrt{m(r)} t}$$

$\downarrow$

$$\frac{\partial \psi_1(t)}{\partial t} = -i\omega \sqrt{m(r)} e^{-i\omega \sqrt{m(r)} t}$$

B) $\psi(t) = e^{-i\omega t}$

$\rightarrow$

$$\psi_1(t_1) = e^{-i\omega t_1}$$

$$\psi_1(t) = e^{-i\omega \sqrt{m(r)} t}$$

$\downarrow$

$$\frac{\partial \psi_1(t)}{\partial t} = -i\omega \sqrt{m(r)} e^{-i\omega \sqrt{m(r)} t}$$