Now we will separate $\vec{E}$ and $\vec{B}$:

- Start with equation (1):

$$\frac{\partial E}{\partial x} = -\frac{\partial B}{\partial t}$$

- Take $\partial/\partial x$ of both sides

$$\frac{\partial}{\partial x}\frac{\partial E}{\partial x} = -\frac{\partial}{\partial x}\left(\frac{\partial B}{\partial t}\right)$$

- Switch derivative order:

$$\frac{\partial^2 E}{\partial x^2} = -\frac{\partial}{\partial t}\left(\frac{\partial B}{\partial x}\right)$$

- Substitute for $\partial B/\partial x$ from equation (2):

$$\frac{\partial^2 E}{\partial x^2} = -\frac{\partial}{\partial t}\overbrace{\left(-\mu_0\epsilon_0\frac{\partial E}{\partial t}\right)}$$

- Simplify:

$$\boxed{\frac{\partial^2 E}{\partial x^2} = \mu_0\epsilon_0\frac{\partial^2 E}{\partial t^2}}$$

Now you try it:

- Start with equation (2):

$$\frac{\partial B}{\partial x} = -\mu_0\epsilon_0\frac{\partial E}{\partial t}$$

- Take $\partial/\partial x$ of both sides
- Switch derivative order:
- Substitute for $\partial E/\partial x$ from equation (1):
- Simplify:

$$\boxed{\frac{\partial^2 B}{\partial x^2} =}$$