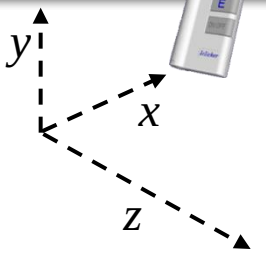
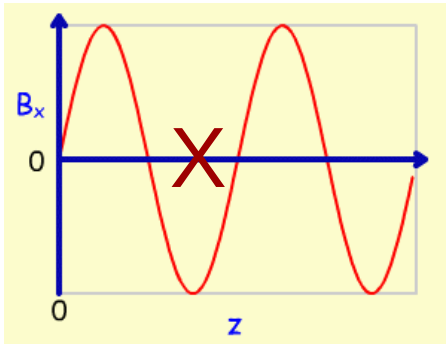
Exercise

An electromagnetic wave is described by:
where $\hat{j}$ is the unit vector in the $+y$ direction.

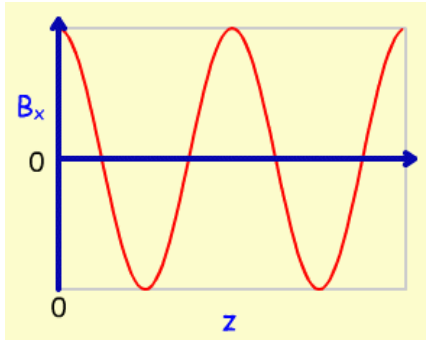
$$\vec{E} = \hat{j}E_0 \cos(kz - \omega t)$$



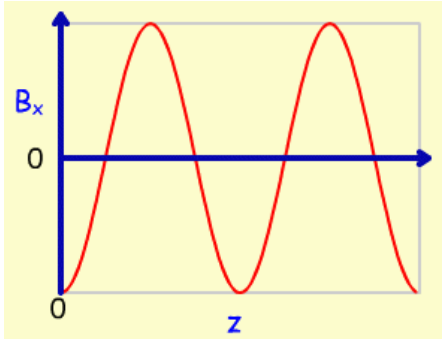
Which of the following graphs represents the $z-$ dependence of B_x at $t = 0$?



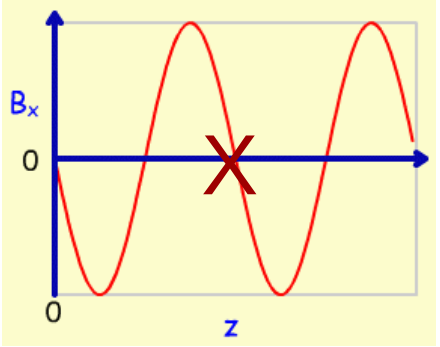
A



B



C

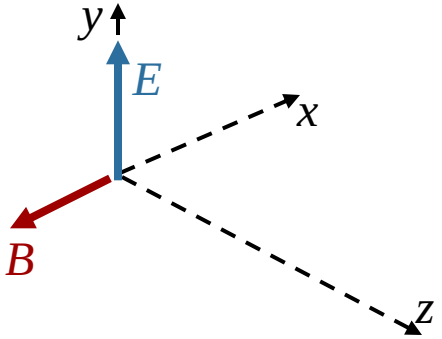


D

E and B are "in phase" (or 180^o out of phase)

$$\vec{E} = \hat{j}E_0 \cos(kz - \omega t)$$ → Wave moves in $+z$ direction

$\vec{E} \times \vec{B}$ Points in direction of propagation



$$\vec{B} = -\hat{i}B_0 \cos(kz - \omega t)$$