An EM wave traveling through a material medium with $\mu = \mu_0$ has $E$-field
\[ E(r, t) = E_0 \hat{y} \cos(k[z - vt]) \]

(a) In what direction is the wave traveling?

(b) In what direction is the wave polarized?

(c) What is the index of refraction $n$ of the material?

(d) What is the wavelength $\lambda$ of the wave?

(e) What is its period $T$?

(f) Write down the corresponding magnetic field $B(r, t)$. 