REPORT ALL NUMBERS TO THREE SIGNIFICANT FIGURES!
Use the conversion constants and data given on the front page.

Given the description below for the electric field in a light beam (x is in meters, t in seconds),

\[ E = (0.325 \text{ V/m}) \sin \left( [5.23 \times 10^{16}]x + [1.20 \times 10^{14}]t \right) \]

\[ \left( \frac{E_{\text{MAX}}}{\sin (kx + \omega t)} \right) \]

(a) Calculate the magnitude of the speed of this wave.

\[ v = \lambda f = \left( \frac{2\pi}{k} \right) \frac{\omega}{2\pi} = \frac{\omega}{k} = 2.29 \times 10^{7} \text{ m/s} \]

(b) Clearly state the direction of the wave.

\[-x, -\hat{i}, \text{ Left}\]

(c) Calculate the maximum value of the B field (use the true velocity of the light in this calculation.)

\[ B_{\text{MAX}} = \frac{E_{\text{MAX}}}{c} = 1.08 \times 10^{-9} \text{ T } \]

(d) Find the wavelength (in meters) of the wave.

\[ \lambda = \frac{2\pi}{K} = 1.20 \times 10^{-6} \text{ m} \]

(e) Calculate the frequency of the wave (in Hz).

\[ f = \frac{\omega}{2\pi} = 1.94 \times 10^{13} \text{ Hz} \]