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

The electric field in a laser beam is described by the following function:

\[ E = (2.15 \times 10^{-3} \text{ V/m}) \sin([1.25 \times 10^7]x - [3.65 \times 10^{13}]t) \]

where \( x \) is in meters and \( t \), in seconds.

\[ E = E_0 (kx - \omega t) \]

(a) Calculate the wavelength of the light in nm.

\[ \lambda = \frac{2\pi}{k} = 503 \text{ nm} \]

(b) Find the frequency, \( f \), for this light in Hz.

\[ f = \frac{\omega}{2\pi} = 5.81 \times 10^{14} \text{ Hz} \]

(c) What is the average value of the Poynting vector for this light? Use the true value of \( c \).

\[ \overline{S} = \frac{E^2}{2\mu_0 c} = 6.13 \times 10^{-9} \text{ W/m}^2 \]

(d) Calculate the velocity of the wave described by this function (not the true value of the velocity of light).

\[ V = \frac{k}{\lambda} = 2.92 \times 10^8 \text{ m/s} \]

(e) Determine the maximum value of the magnetic field using the true value of the velocity of light.

\[ B_0 = \frac{E_0}{c} = 7.17 \times 10^{-12} \text{ T} \]