The function below describes a wave traveling on a stretched string. \((x\) is in meters and \(t\) in seconds.)

\[
y = (1.50 \text{ mm}) \sin(9.90x + 125t - \frac{\pi}{3})
\]

\[
v = A \sin \left( \omega x - \omega t + \delta \right)
v = 9.9
\]

\[
|\omega| = 125
\]

\[
v < 0
\]

(a) Calculate the wavelength of the wave.

\[
\lambda = \frac{2\pi}{k} = 6.35 \cdot 10^{-1} \text{ m}
\]

(b) Calculate the velocity of the wave, including its direction.

\[
v = \frac{\omega}{k} = 12.6 \text{ m/s}, \text{ negative direction}
\]

(c) Calculate the transverse velocity, giving its correct units and direction, for \(x = +2.00 \text{ m}\) and \(t = +3.00 \text{ s}\).

\[
V_x = \frac{dx}{dt} = 125 \cdot 1.5 \cdot 10^{-3} \cos(9.90 \cdot 2 + 125 \cdot 3 - \frac{\pi}{3}) = -9.27 \cdot 10^{-2} \text{ m/s}
\]

(d) Calculate the period \(T\) for the wave.

\[
T = \frac{2\pi}{\omega} = 5.03 \cdot 10^{-2} \text{ s}
\]

(e) If the string has a linear mass density of 0.020 kg/m, calculate the tension in the string.

\[
T = \frac{V^2 \mu}{\lambda}
\]

\[
T = V^2 \mu = 3.18 \text{ N}
\]