M1-SOAC TD1

Chapter 1: General Properties of the Waves Wave Kinematics



Question a:

Two monochromatic waves propagate with frequencies ω_1 and ω_2 equal to 8 and 8.5 radians/s and wavelengths λ_1 et λ_2 equal to 10 and 15 m respectively.

- 1) What are their phase speeds?
- 2) What is the group speed of the modulation, and in which direction?

Question b:

Consider a wave for which the amplitude function is given by

$$\psi = \psi_0 e^{i(kx - \omega t)}$$

Given that the speed of propagation of this wave obeys

$$\frac{\partial \psi}{\partial t} + c_x \frac{\partial \psi}{\partial x} = 0$$

 \rightarrow show that this wave propagates in the x direction with speed $c_x = \omega/k$.