5. Light of wavelength $5.0 \times 10^{-7}$ meter in air is incident normally on a double slit. The distance between the slits is $4.0 \times 10^{-4}$ meter, and the width of each slit is negligible. Bright and dark fringes are observed on a screen 2.0 meters away from the slits.

(a) Calculate the distance between two adjacent bright fringes on the screen.

The entire double-slit apparatus, including the slits and the screen, is submerged in water, which has an index of refraction 1.3.

(b) Determine each of the following for this light in water.
   i. The wavelength
   ii. The frequency

(c) State whether the distance between the fringes on the screen increases, decreases, or remains the same. Justify your answer.