Chapter 17 Problem 50

What is the ratio of the wavelength in air to that in seawater?

Begin with $v = f \cdot \lambda \rightarrow \lambda = \frac{v}{f}$

In air $\lambda_a = \frac{v_a}{f}$

In seawater $\lambda_w = \frac{v_w}{f}$

So the ratio of λ_a to λ_w is

$$\frac{\lambda_a}{\lambda_w} = \frac{\frac{v_a}{f}}{\frac{v_w}{f}} = \frac{v_a}{v_w}$$

Using Table 17.1

$v_a = 343 \text{ m/s}$ $v_w = 1540 \text{ m/s}$

$$\frac{\lambda_a}{\lambda_w} = \frac{343 \text{ m/s}}{1540 \text{ m/s}} = \boxed{0.223}$$