

# Chapter 16

# Problem 40

$$f = 10.0 \text{ Hz}$$

$$\text{distance } x = 84.0 \text{ km} = 8.4 \times 10^4 \text{ m}$$

$$\Delta t = 12.0 \text{ s}$$

Since waves travel at constant speed (assuming properties of the crust are uniform)

$$\text{Then } x = v \cdot t \rightarrow v = \frac{x}{t} = \frac{8.4 \times 10^4 \text{ m}}{12.0 \text{ s}}$$

$$v = 7,000 \text{ m/s}$$

Now for waves

$$v = f \cdot \lambda$$

$$\therefore \lambda = \frac{v}{f} = \frac{7,000 \text{ m/s}}{10 \text{ Hz}}$$

$$\boxed{\lambda = 700 \text{ m}}$$