

$$\begin{aligned}
 2. \quad v &= \frac{d}{t} \\
 &= \frac{4.60 \text{ m}}{2.00 \text{ s}} \\
 &= 2.30 \text{ m/s}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad v &= \mu f \\
 f &= \frac{2.5 \text{ m/s}}{5.0 \text{ m}} \\
 &= 0.50 \text{ Hz} \\
 T &= \frac{1}{f} \\
 &= \frac{1}{0.50 \text{ Hz}} \\
 &= 2.0 \text{ s}
 \end{aligned}$$

4. Frequency is the number of waves per second.

$$\begin{aligned}
 \frac{9.5 \text{ waves}}{60 \text{ s}} &= \frac{f}{1 \text{ s}} \\
 f &= 0.16 \text{ Hz}
 \end{aligned}$$

$$\begin{aligned}
 5. \quad f &= \frac{1}{T} \\
 &= \frac{1}{1.00 \times 10^{-2} \text{ s}} \\
 &= 1.00 \times 10^2 \text{ Hz} \\
 v &= \mu f \\
 \mu &= \frac{v}{f} \\
 &= \frac{335 \text{ m/s}}{1.00 \times 10^2 \text{ Hz}} \\
 &= 3.35 \text{ m}
 \end{aligned}$$

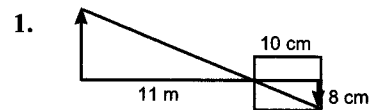
$$\begin{aligned}
 6. \quad v &= \mu f \\
 \mu &= \frac{v}{f} \\
 &= \frac{3.00 \times 10^8 \text{ m/s}}{1.00 \times 10^6 \text{ Hz}} \\
 &= 3.00 \times 10^2 \text{ m}
 \end{aligned}$$

$$\begin{aligned}
 7. \quad \frac{4.0 \times 10^1 \text{ waves}}{300 \text{ s}} &= \frac{f}{1 \text{ s}} \\
 f &= 0.133 \text{ Hz} \\
 v &= \mu f \\
 &= (4.0 \text{ m})(0.133 \text{ Hz}) \\
 &= 0.53 \text{ m/s}
 \end{aligned}$$

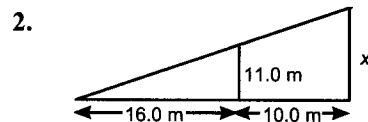
$$\begin{aligned}
 8. \quad v &= \mu f \\
 f &= \frac{v}{\lambda} \\
 &= \frac{3.00 \times 10^8 \text{ m/s}}{5.00 \times 10^{-7} \text{ m}} \\
 &= 6.00 \times 10^{14} \text{ Hz} \\
 f &= \frac{1}{T}
 \end{aligned}$$

$$\begin{aligned}
 T &= \frac{1}{6.00 \times 10^{14} \text{ Hz}} \\
 &= 1.67 \times 10^{-15} \text{ s}
 \end{aligned}$$

Lesson 2—Shadows and Images



$$\begin{aligned}
 \frac{\text{height of large } \Delta}{\text{base of large } \Delta} &= \frac{\text{height of small } \Delta}{\text{base of small } \Delta} \\
 \frac{8.0 \text{ cm}}{10.0 \text{ cm}} &= \frac{x}{11 \text{ m}} \\
 x &= 8.8 \text{ m}
 \end{aligned}$$



$$\begin{aligned}
 \frac{\text{height of large } \Delta}{\text{base of large } \Delta} &= \frac{\text{height of small } \Delta}{\text{base of small } \Delta} \\
 \frac{11.0 \text{ m}}{16.0 \text{ m}} &= \frac{x}{26.0 \text{ m}} \\
 x &= 17.9 \text{ m}
 \end{aligned}$$