

Chapter 6

Please use this as a guide to format your solutions to problems.

6. given info
 $f = 5.0 \times 10^2 \text{ Hz}$
 $\lambda = 3.0 \text{ m}$
 $v = ?$

$v = f\lambda$
 $= (5.0 \times 10^2 \text{ Hz})(3.0 \text{ m})$

$v = 1.5 \times 10^3 \text{ m/s}$

list given info
box answers
significant digits
units

7. $\lambda = 6.0 \text{ m}$
 $v = 5.6 \text{ m/s}$

(a) $v = f\lambda$
 $\therefore f = \frac{v}{\lambda} = \frac{(5.6 \text{ m/s})}{(6.0 \text{ m})} = 0.9333 \text{ Hz}$

$f = 0.93 \text{ Hz}$

(b) $v = f\lambda = \frac{\lambda}{T}$
 $\therefore T = \frac{\lambda}{v} = \frac{6.0 \text{ m}}{5.6 \text{ m/s}} = 1.071 \text{ s}$

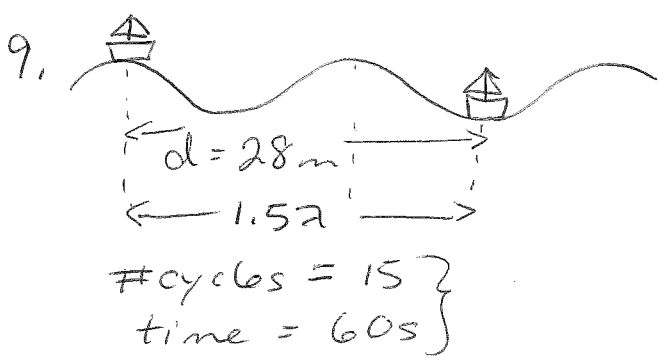
$T = 1.1 \text{ s}$

8. $\lambda = 5.0 \text{ m}$
 $d = 8.6 \text{ m}$
 $t = 5.0 \text{ s}$

$v = \frac{d}{t}$
 $v = f\lambda$
 $\therefore f = \frac{v}{\lambda} = \frac{(d/t)}{\lambda}$

$\therefore f = \frac{(8.6 \text{ m}/5.0 \text{ s})}{5.0 \text{ m}} = 0.344 \text{ Hz}$

$f = 0.34 \text{ Hz}$



$\lambda = \frac{d}{1.5}$
 $v = f\lambda$
 $v = \left(\frac{\# \text{ cycles}}{t}\right) \times \lambda$
 $= \left(\frac{15}{60 \text{ s}}\right) \times \left(\frac{28 \text{ m}}{1.5}\right)$

$v = 4.7 \text{ m/s}$

10. $\lambda = 3.7\text{m}$
 $T = 1.5\text{s}$

(a) $v = f\lambda = \frac{\lambda}{T}$

$\therefore v = \frac{3.7\text{m}}{1.5\text{s}} = 2.46667\text{m/s}$

$v = 2.5\text{m/s}$

(b) $v = \frac{d}{t} \therefore t = \frac{d}{v} = \frac{100\text{m}}{(3.7)(1.5\text{s})} = 40.54\text{s}$

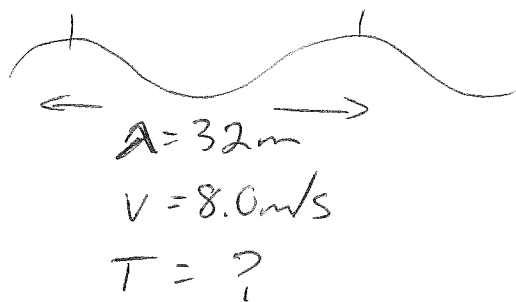
$t = 41\text{s}$

(c) $d = v \cdot t$

$= \left(\frac{3.7\text{m}}{1.5\text{s}}\right) \times (60\text{s}) = 148\text{m}$

$\therefore d = 1.5 \times 10^2\text{m}$

11.



$v = f\lambda = \frac{\lambda}{T}$

$\therefore T = \frac{\lambda}{v} = \frac{32\text{m}}{8.0\text{m/s}}$

$T = 4.0\text{s}$

12. $\lambda = 8.0\text{m}$

$v = 2.0\text{m/s}$

cycles = ?

$t = 1.0\text{min} = 60\text{s}$

$v = f\lambda \quad f = \frac{\# \text{cycles}}{t}$

$\therefore v = \left(\frac{\# \text{cycles}}{t}\right) \lambda$

$\therefore \# \text{cycles} = \frac{v \times t}{\lambda} = \frac{(2.0\text{m/s})(60\text{s})}{8.0\text{m}}$

cycles = 15