13) $f = ?$

$d_i = 6.0m$

$d_o = 3.0m$

$\frac{1}{3} + \frac{1}{6} = \frac{1}{f}$

$\frac{2}{6} + \frac{1}{6} = \frac{1}{f}$

$\frac{3}{6} = \frac{1}{2} = \frac{1}{f} \quad \therefore \boxed{f = 2.0m}$

14) $n = 1.52$

$\theta_{ic} = ?$

$\sin^{-1}\left(\frac{1}{1.52}\right) = 41.1$

$\boxed{\theta_{ic} = 41.1^\circ}$

15) $\theta_{ic} = 45^\circ$

$n = ?$

$\sin(45^\circ) = \frac{1}{n}$

$0.7071 = \frac{1}{n}$

$n = \frac{1}{0.7071}$

$\boxed{n = 1.41}$

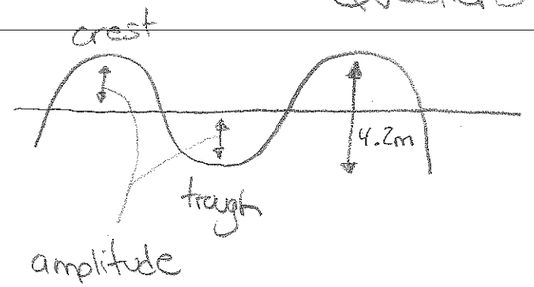
16) $n = \frac{c}{v}$ $\quad n = 2.0 \quad c = 3.00 \times 10^8 m/s \quad v = ?$

$2.0 = \frac{3.00 \times 10^8}{v}$

$v(2.0) = 3.00 \times 10^8$

$v = \frac{3.00 \times 10^8}{2}$ $\quad \boxed{v = 1.5 \times 10^8 m/s}$

Waves : Optics Review Questions

1) 

$\boxed{\text{amplitude} = 2.1m}$

2) tuning fork $\quad v = \lambda f$

$v = 3.4 \times 10^2 m/s$

$f = 256 Hz$

$\lambda = ?$

$3.4 \times 10^2 m/s = \lambda(256 Hz)$

$\div 256 \qquad \div 256$

$1.328 m = \lambda$

$\boxed{1.3m = \lambda}$

3) $v = \lambda f$

$\lambda = 610nm = 6.10 \times 10^{-7} m \quad (610 \times 10^{-9} m)$

$v = 3.00 \times 10^8 m/s$

$f = ?$

$3.00 \times 10^8 m/s = (6.10 \times 10^{-7} m)(f)$

$\boxed{f = 4.9 \times 10^{14} Hz}$

4) $f = \frac{1}{\text{period}}$ $\quad \frac{3}{1 \text{ second}} \rightarrow \frac{1}{0.33s} \rightarrow 3 Hz$

$v = 4m/s$ $\quad \lambda = ?$ $\quad 4m/s = \lambda(3Hz)$

$\boxed{\frac{4}{3} = \lambda}$

5) $\lambda = 25cm \rightarrow 0.25m$ $\quad 25cm \times \frac{1m}{100cm} = 0.25m$

$V = 5 km/hr \times \frac{1 hr}{3600s} \times \frac{1000m}{1 km} = 1.4 m/s$

$f = ?$

$1.4 m/s = 0.25m\,(f)$

$\boxed{5.6 Hz = f}$

6) a) $f = \frac{36}{180s} \rightarrow \frac{1}{0.2s} \rightarrow \boxed{5Hz = f}$

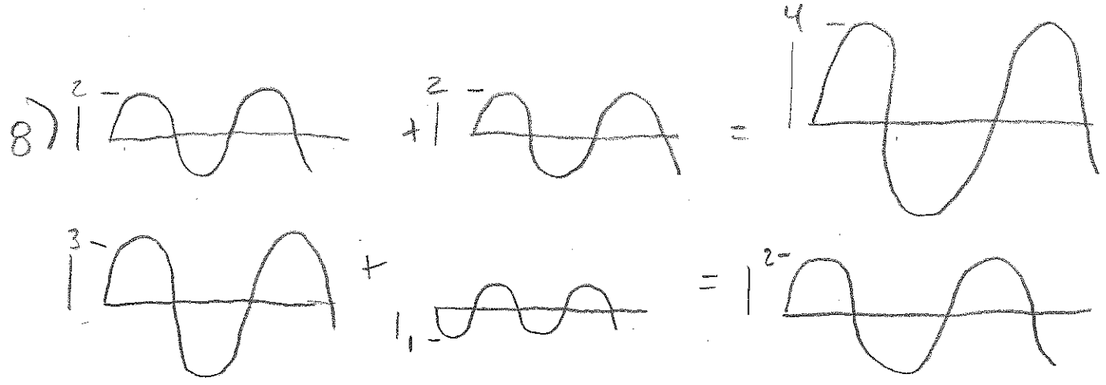
b) $P = \frac{1}{f} = \frac{1}{5} = \boxed{0.2s = P}$

7) $f = \frac{1}{P}$

a) $\frac{1}{100} = \boxed{0.01 Hz}$

b) $\frac{1}{0.5} = \boxed{2 Hz}$

c) $\frac{1}{0.01} = \boxed{100 Hz}$

8) 

9) a) $f = \frac{1}{3600s} = 2.77 \times 10^{-4} Hz$

$P = \frac{1}{2.77 \times 10^{-4}} = \boxed{3600s} \times 12hrs = \boxed{43200s}$

$P = \frac{1}{1/3600} \rightarrow X \times \frac{3600}{X} = \boxed{3600s} \times 12hrs$

$= 43200s$

10) SKIP

11) at the focus

12) $d_o = 2.5m$

$f = 1.0m$

$d_i = ?$

$\frac{1}{2.5} + \frac{1}{d_i} = \frac{1}{1}$ (0.4)

$\frac{1}{d_i} = 1 - \frac{1}{2.5}$

$\frac{1}{d_i} = 1 - 0.4$

$\frac{1}{d_i} = 0.6$

$\frac{1}{0.6} = d_i$

$\boxed{1.7m = d_i}$