

Final Review

Unit 9 - Waves & Sound

33) • transverse oscillations perpendicular to the movement of the wave

- longitudinal - oscillations parallel
- sound is a longitudinal wave.

34) • mechanical - requires a medium (air, water, etc.) to travel through (no vacuum)

• electromagnetic - does not require a medium (can travel through a vacuum.)

• sound is a mechanical wave.

35) a) $f = \frac{\text{cycles}}{\text{second}} = \frac{8}{5} = \boxed{1.6 \text{ Hz}}$

b) $T = \frac{\text{seconds}}{\text{cycle}} = \frac{5}{8} = \boxed{0.625 \text{ s}}$

36) $\lambda = 3.4 \text{ m}, T = 2.5 \text{ s} \quad (v = \lambda f = \frac{\lambda}{T})$

$v = \frac{\lambda}{T} = \frac{3.4}{2.5} = \boxed{1.36 \text{ m/s}}$

37) a) $v = \lambda \cdot f$

$3 \times 10^8 = 660 \times 10^{-9} \cdot f \rightarrow f = \boxed{4.55 \times 10^{14} \text{ Hz}}$

b) $v = \lambda f$

$3 \times 10^8 = \lambda (6.32 \times 10^{14}) \rightarrow \lambda = \boxed{4.75 \times 10^{-7} \text{ m}}$

38) $t = \frac{1.8}{2} = 0.9$

$d = vt = 355 (0.9) = \boxed{319.5 \text{ m}}$

39) $v = 331.3 + .606 (35) = \boxed{352.51 \text{ m/s}}$

40) Yes - sound travels (fastest through solids) faster through liquids, and slower through gases.

41) a) $f = 320 \cdot \frac{3}{2} = \boxed{480 \text{ Hz}}$

b) $f = 320 \div \frac{2}{1} = \boxed{160 \text{ Hz}}$

42) $140 - 60 = 80 \text{ dB} = 8 \text{ Bel} \rightarrow \boxed{10^8 = 100,000,000 \text{ times more intense}}$

43) Sensation that waves produced by objects ~~are~~ moving

and vice versa \rightarrow toward you have higher frequency (waves get "bunched up"). Sounds will be higher pitched if an object is approaching & lower pitch as it's departing.

44) No - it applies to all waves (ex: light & the "red shift")