

Waves HW #2 (TSO 1005) p. 225 #3, 7, 8, 11, 18, 19

③ $v_s = 330 \text{ m/s}$ What is λ that goes with

a) $f = 256 \text{ Hz}$ $\lambda = v/f = \frac{330 \text{ m/s}}{256 \text{ Hz}} = \boxed{1.29 \text{ m}}$

b) $f = 25 \text{ kHz}$ $\lambda = \frac{330 \text{ m/s}}{25,000 \text{ Hz}} = \boxed{.0132 \text{ m}}$ or 1.32 cm

⑦ Stone dropped on still pond at $t=0$. Wave reach floating leaf at $d = 3.00 \text{ m}$. Use Figure 2-21.

a) $v = 3.0 \text{ m/s}$

b) $T = 1.5 \text{ s}$ $f = \frac{1}{T} = \boxed{0.67 \text{ Hz}}$

c) $\lambda = v \cdot T = 3.0 \text{ m/s} \times 1.5 \text{ s} = \boxed{4.5 \text{ m}}$

Amplitude = $\boxed{10 \text{ cm}}$

⑧ Sound wave $f = 500 \text{ Hz}$ travels from air \rightarrow water.

$v_{\text{air}} = 330 \text{ m/s}$ $v_{\text{water}} = 1490 \text{ m/s}$

What is λ in ..

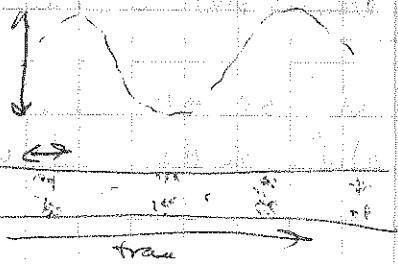
a) air $\lambda = \frac{v_{\text{air}}}{f} = \frac{330}{500} = \boxed{0.66 \text{ m}}$

b) water $\lambda = \frac{v_{\text{water}}}{f} = \frac{1490}{500} = \boxed{2.98 \text{ m}}$

⑩ Ship sends sonar pulse $f = 30 \text{ kHz}$ and duration of 1 ms . towards a sub and receives a reflection 3.2 s later $v_{\text{sound}} = 1500 \text{ m/s}$

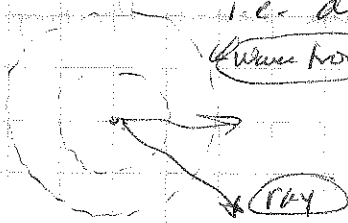
$\lambda = \frac{v}{f} = \frac{1500}{30,000} = .05 \text{ m}$

(18) Transverse = vibration is \perp to travel



Longitudinal = vibration \parallel to travel

(19) a) Wave front = a surface made of crests that is always 90° to direction of travel
i.e. dropping a pebble. All pts on wave fronts are in the same phase



b) ray = lines showing direction of wave travel \perp to wave fronts