

P #1

Ch 14 - pg 456

$$t_{\text{light}} = t_{\text{sound}} - 16.2 \text{ sec}$$

$$V_{\text{light}} = 3.00 \times 10^8 \text{ m/s}$$

$$V_{\text{sound}} = 343 \text{ m/s}$$

$$d_{\text{light}} = d_{\text{sound}}$$

If distances are equal:

$$d_{\text{light}} = d_{\text{sound}}$$

$$V_{\text{light}} \cdot t_{\text{light}} = V_{\text{sound}} \cdot t_{\text{sound}}$$

$$(3.00 \times 10^8 \text{ m/s}) \cdot (t_{\text{sound}} - 16.2) = (343 \text{ m/s}) \cdot t_{\text{sound}}$$

$$t_{\text{sound}} = 16.200019 \text{ sec}$$

(Note that the extra time for the light to reach you could be ignored!)

Find d:

$$d_{\text{sound}} = V_{\text{sound}} \cdot t_{\text{sound}}$$

$$= (343 \text{ m/s}) \cdot (16.200019 \text{ sec})$$

$$d_{\text{sound}} = 5560 \text{ m}$$