

P#41

Ch 22

$$v_{\text{Air}} = 343 \text{ m/s} \quad (\text{air})$$

$$v_{\text{concrete}} = 1850 \text{ m/s} \quad (\text{concrete})$$

$$n_{\text{air}} = 1.00$$

(By definition)

a) Find n_{concrete}

$$n = \frac{v_{\text{air}}}{v_{\text{concrete}}} = \frac{343 \text{ m/s}}{1850 \text{ m/s}} = .185$$

Find θ_c :

$$\sin \theta_c = \frac{n_{\text{concrete}}}{n_{\text{air}}}$$

$$\sin \theta_c = \frac{.185}{1.00}$$

(smaller n value
must be on top
to achieve
critical angle)

$$\boxed{\theta_c = 10.7^\circ}$$

b) Wave must travel in slower medium initially,
so sound must begin in Air