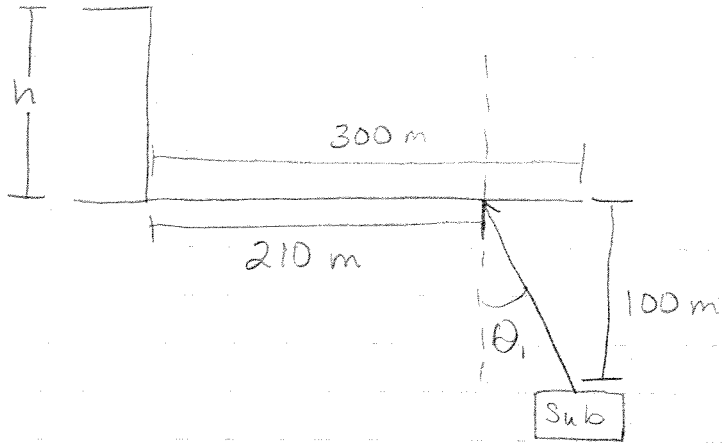
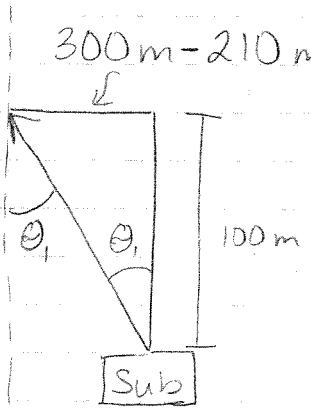
P #22

Ch 22 - pg 708



Use geometry to find θ_1:



$$\tan\theta_1 = \frac{90\,m}{100\,m}$$

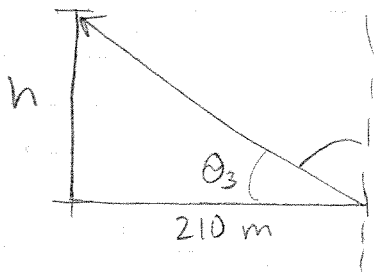
$$\theta_1 = 42°$$

Find θ_2: $n_1 = 1.33$, $\theta_1 = 42°$ $\quad$ $n_2 = 1.00$, $\theta_2 = ?$

$$n_1 \cdot \sin\theta_1 = n_2 \cdot \sin\theta_2$$
$$(1.33)\cdot \sin 42° = (1.00)\cdot \sin\theta_2$$

$$\theta_2 = 62.8°$$

Use geometry to find h:



$$\theta_3 = 90° - 62.8° = 27.2°$$

$$\tan\theta_3 = \frac{h}{210}$$

$$\tan 27.2° = \frac{h}{210}$$

$$\boxed{h = 108\ m}$$