

$$\theta_1 = 30^\circ$$

$$\theta_2 = 19.24^\circ$$

$$n_1 = 1.0$$

$$\begin{aligned} \text{a)} \quad n_1 \sin \theta_1 &= n_2 \sin \theta_2 \\ (1.0) \sin 30^\circ &= n_2 \sin 19.24^\circ \end{aligned}$$

$$n_2 = 1.52$$

(Note: b through d not in order)

$$\text{d)} \quad v_2 = ?$$

$$n_2 = \frac{c}{v_2}$$

$$(1.52) = \frac{3.0 \times 10^8 \text{ m/s}}{v_2}$$

$$v_2 = 1.98 \times 10^8 \text{ m/s}$$

$$\text{c)} \quad f_2 = ?$$

$$f_2 = f_1 = \frac{v_1}{\lambda_1}$$

$$f = \frac{(3.0 \times 10^8 \text{ m/s})}{(632.8 \times 10^{-9} \text{ m})}$$

$$f_2 = f_1 = 4.74 \times 10^{14} \text{ Hz}$$

$$\text{b)} \quad \lambda_2 = ?$$

$$v_2 = f_2 \cdot \lambda_2$$

$$(1.98 \times 10^8 \text{ m/s}) = (4.74 \times 10^{14} \text{ Hz}) \cdot \lambda_2$$

$$\lambda_2 = 4.17 \times 10^{-7} \text{ m}$$

$$\lambda_2 = 417 \text{ nm}$$