

**CHAPTER 22 p. 629**

5. The frequency of the microwave is

$$f = c/\lambda = (3.00 \times 10^8 \text{ m/s}) / (1.60 \times 10^{-2} \text{ m}) = 1.88 \times 10^{10} \text{ Hz.}$$

6. The wavelength of the radar signal is

$$\lambda = c/f = (3.00 \times 10^8 \text{ m/s}) / (29.75 \times 10^9 \text{ Hz}) = 1.01 \times 10^{-2} \text{ m} = 1.01 \text{ cm.}$$

7. The wavelength of the wave is

$$\lambda = c/f = (3.00 \times 10^8 \text{ m/s}) / (9.66 \times 10^{14} \text{ Hz}) = 3.11 \times 10^{-7} \text{ m} = 311 \text{ nm.}$$

This wavelength is just outside the violet end of the visible region, so it is **ultraviolet**.

8. The frequency of the wave is

$$f = c/\lambda = (3.00 \times 10^8 \text{ m/s}) / (650 \times 10^{-9} \text{ m}) = 4.62 \times 10^{14} \text{ Hz.}$$

This frequency is in red end of the visible region, so it is **visible**.