

PHYSICS 1020

Homework #9

(Due May 3, 2010)

1. (Giancoli 22-5) What is the frequency of a microwave whose wavelength is 1.60 cm?
2. (Giancoli 22-9) How long does it take light to reach us from the Sun, 1.50×10^8 km away?
3. (Giancoli 22-16) Who will hear the voice of a singer first—a person in the balcony 50.0 m away from the stage (text Fig. 22–19), or a person 3000 km away at home whose ear is next to the radio? How much sooner? Assume that the microphone is a few centimeters from the singer and the temperature is 20 °C.
4. (Giancoli 23-15) (a) Where should an object be placed in front of a concave mirror so that it produces an image at the same location as the object? (b) Is the image real or virtual? (c) Is the image inverted or upright? (d) What is the magnification of the image?
5. (Giancoli 23-23) What is the speed of light in (a) crown glass, (b) Lucite, and (c) ethyl alcohol?
6. (Giancoli 23-27) A diver shines a flashlight upward from beneath the water at a $42^\circ.5$ angle to the vertical. At what angle does light leave the water?