Chapter 13 Lecture Practice Problems

Directions: Complete the following problems according to the Light and Reflection lesson.

1. The speed of light in a vacuum is: _____

- 2. Wave speed equation
 - a. Where the variables equal:

Use your reference table to determine:

- Which color of light has the shortest wavelength?
- What is the color of light that possesses a frequency of 5.10×10^{14} hz?
- A photon of light has a frequency of 4.0×10^{10} hz. What range of the EMS is it in?
- Which photon has more energy?
 - Gamma or infared?

2. Which of the following statements is true about the speeds of gamma rays and radio waves in a vacuum?

- F. Gamma rays travel faster than radio waves.
- **G.** Radio rays travel faster than gamma rays.
- H. Gamma rays and radio waves travel at the same speed in a vacuum.
- J. The speed of gamma rays and radio waves in a vacuum depends on their frequencies.

EMS Short Response Practice Problem

What is the frequency of a photon of light that has a wavelength of 3.8 x 10⁻⁷ m?
What region of the EMS is it located?

Short Response, continued

13. X rays emitted from material around compact massive stars, such as neutron stars or black holes, serve to help locate and identify such objects. What would be the wavelength of the X rays emitted from material around such an object if the X rays have a frequency of 5.0×10^{19} Hz?