1. When light passes through a prism of glass,

- **a.** the prism adds colors to different parts of the outgoing and broadly scattered beam.
- **b.** refraction changes the directions of different colors or wavelengths of light.
- **c.** different colors are caused by multiple reflections within the prism and the resulting interference between the beams.
- **d.** the prism absorbs colors from different parts of the broad beam coming out of the prism, leaving the complementary colors that we see.

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2. Radio waves travel through space at what speed?

- **a.** slightly faster than the speed of light because their wavelength is longer
- **b.** at the speed of light, 3×10^8 m/s
- **c.** much faster than the speed of light
- **d.** much slower than the speed of light

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3. What is the magnification of a Newtonian telescope that has a primary mirror of diameter 0.25 m and focal length of 2 m when used with an eyepiece of focal length 25 mm and an optical diameter of 5 mm?

- **a.** 400 times
- **b.** 50 times
- **c.** 80 times
- **d.** 10 times

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4. One major difference between radio waves and light is that

- **a.** light waves are electromagnetic, whereas radio waves are not.
- **b.** radio waves are electromagnetic, whereas light waves are not.
- **c.** radio waves have longer wavelength than light waves.
- **d.** radio waves have shorter wavelength than light waves.

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5. Almost all of the information we have about distant astronomical objects comes from an analysis of

- **a.** meteorite fragments.
- **b.** electromagnetic radiation.
- **c.** cosmic rays.
- **d.** radioactive decay products.

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6. Violet light differs from red light in that it

- **a.** has a longer wavelength than red light.
- **b.** travels more slowly (through a vacuum) than red light.
- **c.** has a shorter wavelength than red light.
- **d.** travels more quickly (through a vacuum) than red light.

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7. Which of the following can travel at the speed of light in a vacuum?

- **a.** only light; all other electromagnetic waves travel slower than the speed of light.
- **b.** light, atoms, X rays, and subatomic particles (e.g., electrons)
- **c.** light, radio waves, X rays, and gamma rays
- **d.** light, infrared, ultraviolet, and subatomic particles (e.g., electrons)

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8. How much more light can the 5-m telescope at Mount Palomar collect from an astronomical source than can the unaided human eye (with a diameter of 5 mm)?

- **a.** 10^6 or 1,000,000 times
- **b.** 1000 times
- **c.** 10,000 times
- **d.** 5000 times
