

# Physics 1214 - General Physics II

Quiz #17 - 2013.03.01

Solutions

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1. What two conditions are to be met for a basic electromagnetic wave to be consistent with the laws of electromagnetism?

The two conditions are (1) The magnitudes of  $\vec{E}$  and  $\vec{B}$  are in a definite, constant ratio,  $E = cB$ , and (2) the speed of the wavefront is  $c = \frac{1}{\sqrt{\epsilon_0\mu_0}}$ .

2. How is the right-hand rule employed for electromagnetic waves?

The thumb points in the direction the wave is traveling, and your hands initially point in the direction of  $\vec{E}$ , and are then curled towards  $\vec{B}$  which is perpendicular to both the direction of travel and  $\vec{E}$ .