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**PREFLIGHTS      LESSON 21 – EM WAVES IN CONDUCTORS / REFLECTION AT  
A CONDUCTING SURFACE**

**LEARNING OBJECTIVES:**

- 1. Describe the differences between electromagnetic waves propagating in conductors and electromagnetic waves propagating in vacuum or insulators.**
- 2. Solve problems involving the propagation of electromagnetic waves in conductors and the reflection of electromagnetic waves from conducting surfaces.**

1) What is the difference between the wave equations in conductors (Equation 9.122) and the wave equations in vacuum (Equation 9.41) that results in the attenuation of a wave propagating through a conductor?

2) For a poor conductor, like glass, what do you predict should happen to  $\kappa$ , the term that characterizes the wave attenuation? On a separate sheet of paper, show mathematically whether or not your prediction is correct.

3) Describe in words why good conductors make good mirrors.

4) *Note: This is a review question from Chapter 8.* Consider Problem 8.5. In part a, which elements of the Maxwell stress tensor will not be zero? Describe in words how you would do part b. Be specific. Tell me which equation(s) applies and tell me which elements of the Maxwell stress tensor are involved and what you would do with those elements.

5) What did you find difficult or confusing in the pre-class work? If nothing was difficult or confusing, tell me what you found most interesting. Please be as specific as possible.

6) Document whatever help you received on the preclass work.