Physics 3034 – Spring 2024
    Due March 13.

Homework 05 – Rev A

SPN 5–01 – Waves in Conductors.
Do Griffith's 9.19.

SPN 5–02 – Skin Depth.
Do Griffith's 9.20.

SPN 5–03 – Reflection from a conductor at normal incidence.
Do Griffith's 9.22.

HINT   Section 9.4.2 gives you the reflected E-field for a conductor, but not the reflection coefficient. However R is defined earlier in the chapter. It is a bit puzzling that $\tilde{\beta}$ is now complex. It's OK to approximate with its magnitude. The short answer is that $R = 1$, but your goal is to find out what the tiny little bit is that it is < 1. Express your answer either as a percentage or a fraction. Doesn't this mean that you have found the transmission coefficient too? (Even though you weren't asked by Griffiths

SPN 5–04 – Energy of a wave in a conductor.
Do Griffith's 9.21.

DISCUSSION   In a vacuum the energy density (u) contains two terms of equal value (one for E, one for B). However in a conductor, per the result of 9.21, almost all of the energy is in B. Does this make sense? Do the calculation and then see if you can give any kind of intuitive explanation of the result. (OK to be "wrong" ... just fun to think about.)