

ME 513 Fall 2015 – Homework No. 4 – Due Nov. 16, 2015 (off-site students, e-mailed before midnight Nov. 16)

From Kinsler, Frey, Koppens and Sanders:

6.2.2

6.2.3 (a) and (b) only

6.2.6C

6.3.3

6.6.1

Additional Problem:

- (i) Derive an expression for the surface normal impedance (at normal incidence) of a fluid layer of depth L (having density ρ_1 and speed of sound c_1) above a perfectly hard backing.
- (ii) Sketch the impedance.
- (iii) Calculate the plane wave pressure reflection coefficient for this layer (the ambient density outside the layer is ρ_0 and the ambient sound speed is c) and show that the magnitude of the reflection coefficient is always equal to unity in this case.