

**ME 513 Fall 2013 – Homework No. 4 – Due Nov. 11, 2013 (off-site students, e-mailed before midnight Nov. 11)**

**From Kinsler, Frey, Koppens and Sanders:**

**6.2.2**

**6.2.6C**

**6.3.4**

**6.4.1**

**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  $\rho_1$  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  $\rho_0$  and the ambient sound speed is  $c$ ) and show that the magnitude of the reflection coefficient is always equal to unity in this case.**