Textbook: Yunus A. Çengel

Chapter: 3.

Examples: 3, 5, 8, 9, 13, 14, 15.

Problems: 20, 35, 45, 54, 70E, 82, 125, 130, 136, 141.

Special Remarks:

- For P.35: Resistances are in parallel.
- Answer for P.54: $\dot{Q} = 189.3$ kW; temperature = 261 ^{o}C; temperature drop = 142 ^{o}C. The geometry is a bit tricky: since it is a composite wall, there are several layers similar to the one shown. The one shown is of course 0.12 by 8 meters. You can solve the problem for a 0.12 by 8 meters and then multiply the result for total heat transfer, etc, by 5/0.12, since it is 5 m in height.
- Answer for P.70E: $\dot{Q} = 95.58$ Btu/h, and error is 0.035%.
- Answer for P.82: $T_1 = T_{\text{interface}} = 71.2$ ^{o}C.
- For P.125: The efficiency is —of course— determined graphically from figure 3-70, and, in the spirit of a unified answer, please use a common value of 0.97. Note outstanding correction in figure P3-125 where the spacing between fins must be 3 mm instead of 3 cm. The answer must also be corrected to $\dot{Q} = 2.64$ kW increase.
- Answer for P.130: $\dot{Q} = 17.4$ kW, $\varepsilon_{\text{fin}} = 7.1$. You should be able to determine the total number of fins. If you count, you find that the number of fins per 1 m is 1/0.006. If you have the same number of rows and columns (square geometry), then you get a total of $1/(0.006)^2$.
- Answer for P.136: $\dot{Q} = 306$ W. Note that the answer in the textbook is incorrect.