Problem 1. (40 points)

Calculate Z, H^R and S^R for propane gas at 115.14 °C and 20 bar using the following methods:

(a) The virial equation of state. (15 points)
(b) Redlich/Kwong equation of state. (15 points)
(c) Lee/Kesler generalized correlations. (10 points)

Problem 2. (10 points)

Using the results from problem 1, estimate the *H* and *S* of propane gas at 115.14 °C and 20 bar. Use the following reference conditions:

Reference State:
Ideal gas at $T = 0$ °C and $P = 1$ bar
H and *S* are equal to zero for the above reference condition.

Problem 3. (20 points)

Solve problem 6.17 from the textbook.

Problem 4. (30 points)

Solve problem 6.52 from the textbook.