Drexel University
Department of Chemical and Biological Engineering
CHE 230 – Chemical Engineering Thermodynamics I
Winter 2024-2025 (202425)
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Midterm Exam – February 11, 2025

This is an example header named example_head-38618812.tex.

1. (15 pts)

   This is an example problem named example_problem_template-38618812.tex.

   Determine the product of 5 and 8.

2. (16 pts)

   This is an example problem named example_problem2_template-38618812.tex.

   Determine the quotient of 3.1 and 359.0.

3. (17 pts)

   Superheated steam at 4 MPa and 357.0°C is to be converted to saturated steam at 3 MPa in a desuperheater. This desuperheater is supplied with inlet liquid water at 45.0°C. The unit should produce saturated steam at a rate of 14.0 kg s^{-1}. Assuming adiabatic operation, and assuming the liquid inlet is saturated, what is the mass flowrate of the inlet water?

   The following enthalpies will be useful:

   Superheated steam at 357.0°C and 4 MPa: $\hat{H} = 3{,}118.34$ kJ/kg;

   Saturated liquid water at 45.0°C: $\hat{H}^{\mathrm{L}} = 188.45$ kJ/kg; and

   Saturated water vapor at 3 MPa: $\hat{H}^{\mathrm{V}} = 2{,}803.91$ kJ/kg.

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