
D R E X E L U N I V E R S I T Y
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

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1. (15 pts)

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Determine the product of 5 and 8.

2. (16 pts)

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Determine the quotient of 3.9 and 357.0.

3. (17 pts)

Superheated steam at 3 MPa and 347.0°C is to be converted to saturated steam at 3 MPa in a desuperheater. This desuperheater is supplied with inlet liquid water at 47.0°C. The unit should produce saturated steam at a rate of 15.0 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 347.0°C and 3 MPa: $\hat{H} = 3,101.04 \text{ kJ/kg}$;

Saturated liquid water at 47.0°C: $\hat{H}^L = 196.80 \text{ kJ/kg}$; and

Saturated water vapor at 3 MPa: $\hat{H}^V = 2,803.76 \text{ kJ/kg}$.

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