

EXAMPLE 3.12

$$\underline{R} := 8.314$$

$$C_p(T) := 29.268 - 0.224 \cdot 10^{-1} T + 2.653 \cdot 10^{-4} T^2 - 4.153 \cdot 10^{-7} T^3 + 20.057 \cdot 10^{-11} T^4$$

Initial guess

$$\underline{T} := 350$$

Given

$$R \cdot T + 4.41 \cdot 10^{-5} \cdot 2 \cdot 10^6 = \int_{400}^T C_p(T) dT$$

$$\underline{T} := \text{Find}(T) = 497.827$$

Alternative Approach

$$\underline{T} := 350$$

$$f(T) := \int_{400}^T C_p(T) dT - R \cdot T - 4.41 \cdot 10^{-5} \cdot 2 \cdot 10^6$$

$$\underline{T} := \text{root}(f(T), T) = 497.827$$