

Thermocouple Example

Type J Coefficients:

$$c_0 := -0.0488683$$

$$c_3 := 1.15692 \cdot 10^7$$

$$c_1 := 19873.1$$

$$c_4 := -2.64918 \cdot 10^8$$

$$c_2 := -218615$$

$$c_5 := 2.01844 \cdot 10^9$$

Temperature/Voltage Relationship:

$$T(V) := \sum_{i=0}^5 (c_i \cdot V^i)$$

Solving for Voltage Given a Temperature:

$$V := 0$$

$$V_{10} := \text{root}(T(V) - 10, V)$$

$$V_{10} = 5.084 \times 10^{-4}$$

$$V := 0$$

Given

$$T(V) = 20$$

$$V_{20} := \text{Find}(V)$$

$$V_{20} = 1.02 \times 10^{-3}$$

Test of Results:

$$T(V_{10}) = 10$$

$$T(V_{20}) = 20$$