Thermodynamics - 2

A closed aluminum vessel of mass 0.3 kg containing 1.0 kg of engine oil is initially at 90°C. The vessel is immersed in a 5.0 kg bath of liquid water initially at 20°C contained in an insulated enclosure. The system is allowed to come to equilibrium.

Specific heat values are aluminum 0.90 kJ/kg-K, oil 1.9 kJ/kg-K, and water 4.18 kJ/kg-K.
Tds=du+pdv Tds=dh+vdp

a) What is the final temperature of the water, aluminum, and oil? **(40 points)**
b) What is the heat transfer from the oil and can to the water? **(30 points)**
c) A thermocouple measures the final water temperature to be 27.2°C. Could this measured value be possible? Support your answer. **(30 points)**