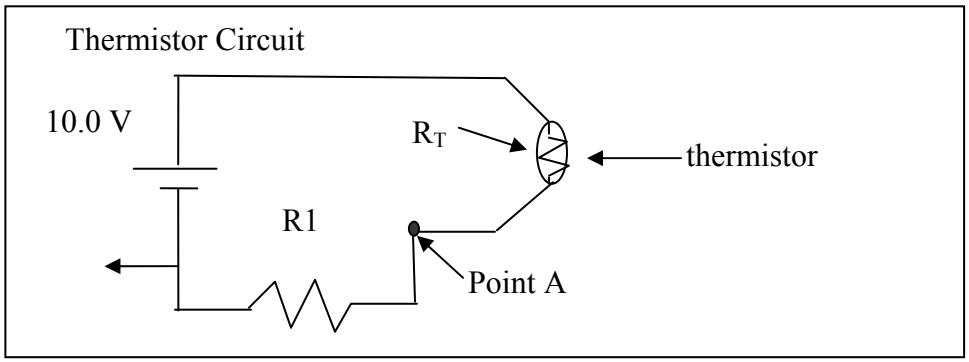
CHEMISTRY 133
Quiz 1 – 10 points
SOLUTIONS

The circuit below is set up to measure temperature using a thermistor. The thermistor is a resistor in which the resistance, R_T, varies with temperature. In the circuit below with R1 = 521 Ω, if the voltage at point A is 3.96 V,
a) Calculate R_T.
b) Thermistors often give erroneous readings due to self-heating (the measured temperature is hotter than the true temperature because of resistive heating). What is the power dissipated in the thermistor?



a) across resistor, R1, $V = V_A - 0 = 3.96$ V = IR1 or I = 3.96 V/ 521 Ω = 0.00760 A
across thermistor, $V = 10 - V_A = 10.0V - 3.96$ V = 6.04 V = IR_T or R_T = 6.04 V/0.00760 A = 795 Ω = **790 Ω** (2 sig figs)
b) P = IV = (0.00760 A)(6.04 V) = **0.046 W**