Consider a battery in an automobile. When connected to the radio (with everything else switched off), the battery provides 12.75 V to the radio. When connected to the headlights (with everything else off), the battery provides 11.75 V to the lights.

Assuming that the radio can be modeled as a 5-Ω resistor and the headlights as a 0.75-Ω resistor, determine the Thevenin equivalent circuit model for the battery.

$V_{Th} =$ _____ $R_{Th} =$ _____
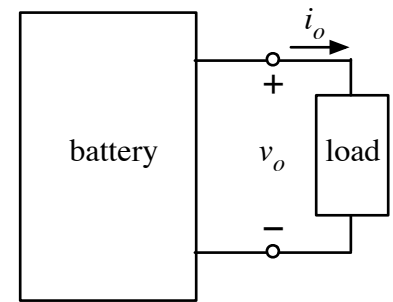
What voltage would the battery provide if the radio and headlights are turned simultaneously? (This is a parallel connection.)

$V_L =$ _____

If the starter can be modeled as a 0.05-Ω resistor, what current flows when the starter is engaged? (Assume that everything else is disconnected when the starter is engaged.)

$I_{start} =$ _____