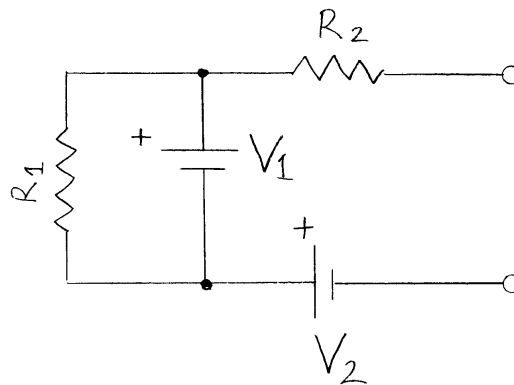


Physics 334, Winter Quarter 2013

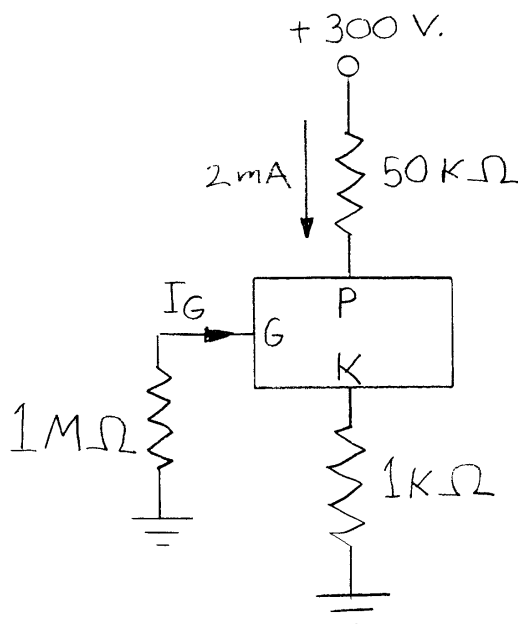
Homework Assignment 1

Due Tuesday January 15 in class or in my mail box before the end of class.

1. For the circuit below, (a) find the Thévenin voltage and resistance V_{Th} and R_{Th} , and the (b) Norton current and resistance I_N and R_N .



2. A “black box” with 3 terminals labeled K, G and P is shown in the circuit below. The current flowing into the G terminal is around 10^{-8} A. (a) Find V_P . (b) Find V_G . (c) Find V_K



3. A “black box” with 3 terminals labeled E, B and C is shown in the circuit below. Assume terminal B is magically always 0.6 V more positive than terminal E, and I_d is very large compared to the current flowing into terminal B. (FYI, this black box is an NPN bipolar transistor.) (a) Find V_C and V_E . (easy to do) (b) Find R_1 and R_2 . Hints: “Assume terminal B is always 0.6 V more positive than terminal E, ...” implies what “dynamic” resistance between terminals B and E? And why does it help that I_d is relatively large?

