Homework 8

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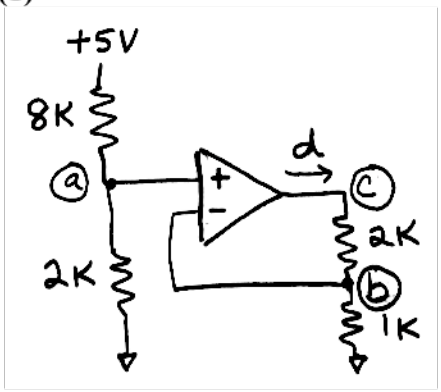
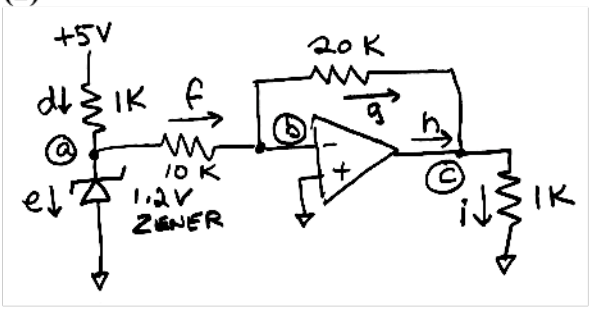
student name TA

For each of the circuits below, using op amps (not comparators) compute the voltages and currents indicated by letters. Show your work.

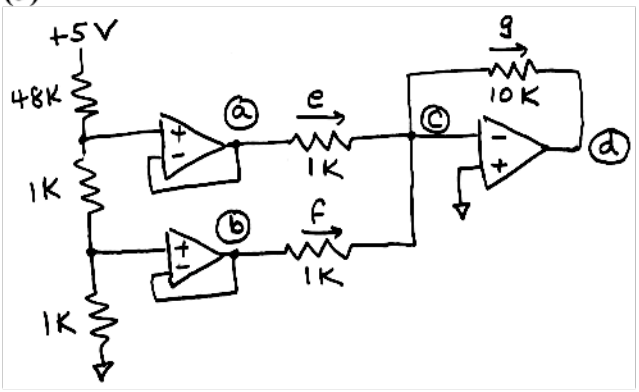
(1)



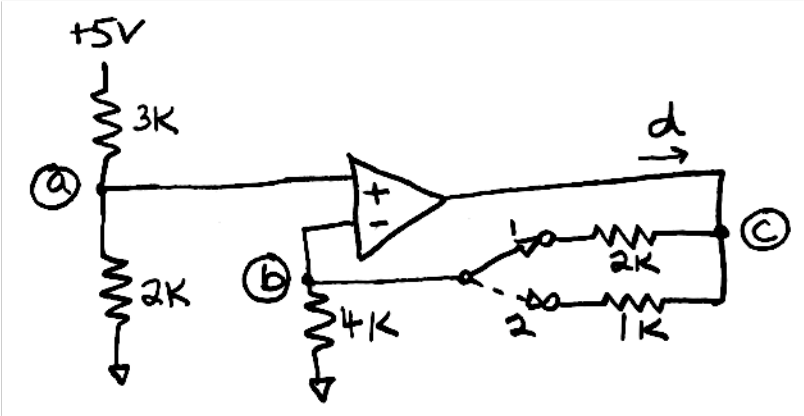
(2)



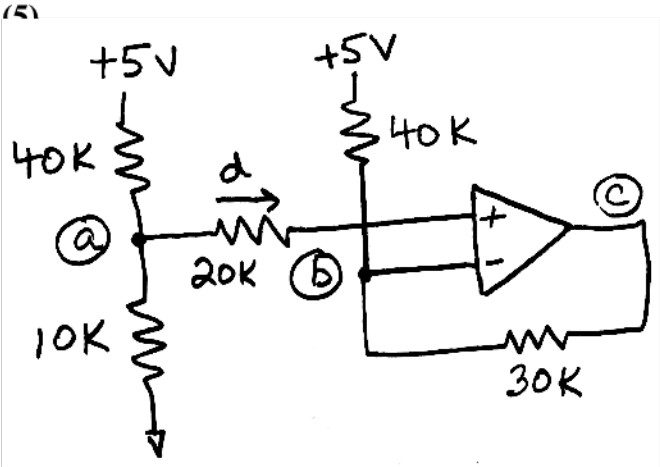
(3)



(4) Calculate voltages and currents with switch in each position.



(5)



(6) An op amp actually has two separate gains, one for each of the inputs. In a perfect op amp $A_1=A_2$. Find the Common Mode Rejection Ratio (CMRR) for a real op amp in which $A_1=600{,}000$ and $A_2=600{,}100$. Express your answer in dB.

answers: (1) a=1V, b=1V, c=3V, d=1mA; (2) a=1.2V, b=0V, -2.4V, d=3.8mA, e=3.68mA, f=0.12mA, g=0.12mA, h= -2.52mA, i= -2.4mA; (3) a=0.2V, b=0.1V, c=0V, d= -3V, e=0.2mA, f=0.1mA, g=0.3mA; (4) a=2V, b=2V, c=(3V or 2.5V), d=0.5mA; (5) a=1V, b=1V, c= -2V, d=0mA; (6) 76 dB (voltage ratio=6000.5).