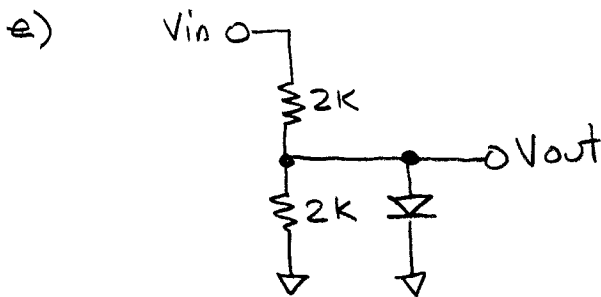
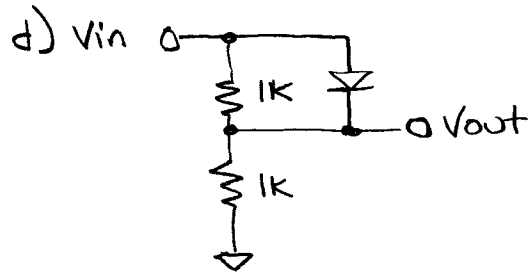
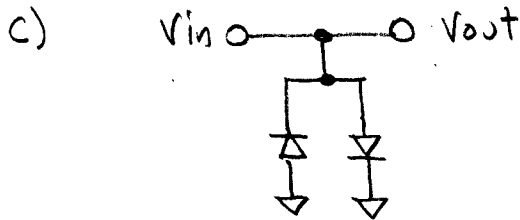
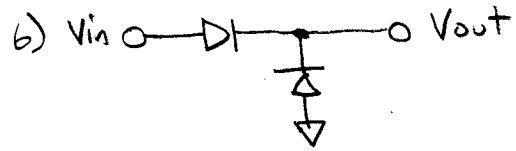
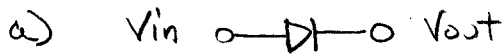


(1) For the following circuits, draw the graph for V_{out} as V_{in} varies from -5 to $+5$ volts. Assume all diodes have 0.7 volt forward voltage drop.



(2) The input to the Tekbot charger board can be used with a wall wart that has a power plug with either a positive or negative polarity center contact. Show how the 4 diodes at the input to the charger perform this function by redrawing that portion of the schematic and showing the two possible current paths.

(3) For the circuit below, find the resistance value and lowest wattage rating ($1/8, 1/4, 1/2$ W) such that the Zener diode has at least 10 mA flowing in it at all times but that will not exceed its power dissipation limit. V_{in} may vary from 10 to 14 volts, and the load from 0 to 5 mA.

