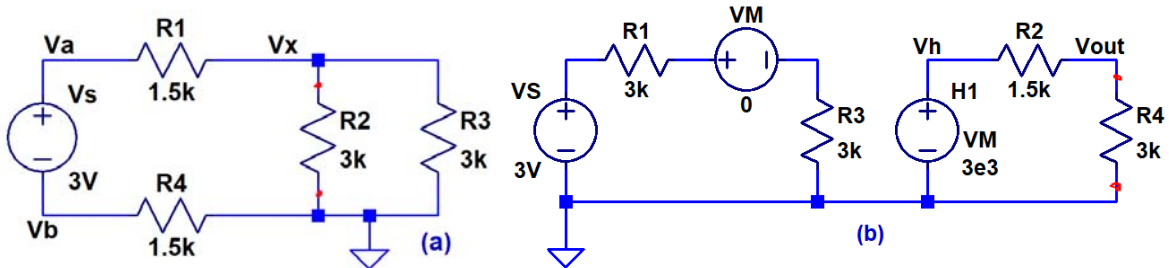
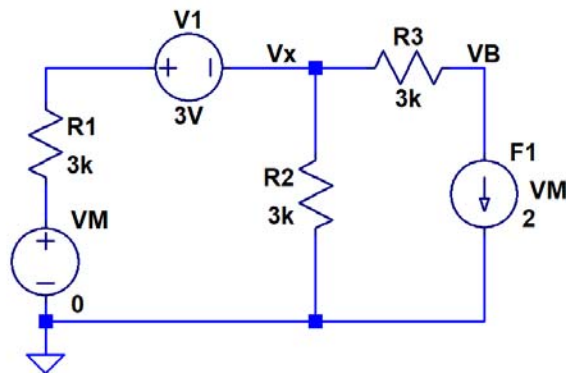


Show your work for credit!

- Calculate the voltage across  $V_x$  and  $V_{out}$  in the following circuits. Next find the Thevenin and Norton equivalent circuits at the port indicated by the red dots in the below schematics (this means without  $R_2$  or  $R_4$  in the circuit). Show that your equivalent circuits are correct and then verify with LTspice. (6 points)



- Calculate  $V_B$  in the following circuit and then verify your calculation using LTspice. (3 points)



- Write an equation for  $V_{out}$  as a function of  $V_{in}$  in the following circuits. Plot  $V_{out}$  if  $V_{in}$  varies from -1 to 1 V in each circuit. Verify your answers, including your plots, using a DC sweep in LTspice. (6 points)

