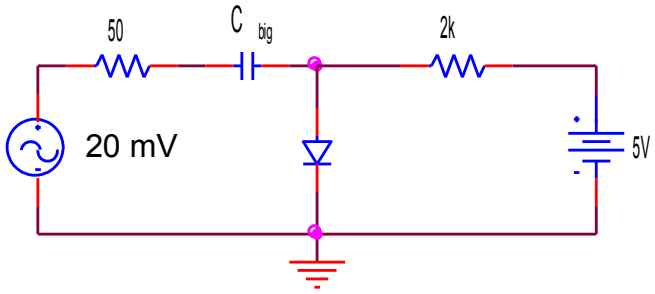
ELEC 306 Test #1 Sample Problems

1. For the circuit shown assume the capacitor is large enough to appear as a short circuit to any AC signals and as an open circuit to any DC signals.



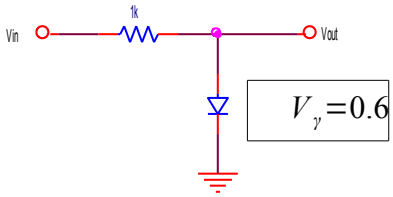
a. Using the diode equation, determine I_{DQ} and V_{DQ} if $I_S = 10^{-12}\ Amps$

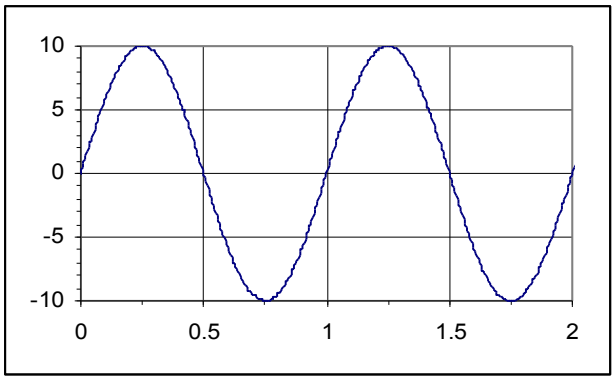
b. Determine the AC voltage across the diode.

c. Repeat part a for $V_\gamma = 0.5\,v \wedge r_f = 100\,\Omega$

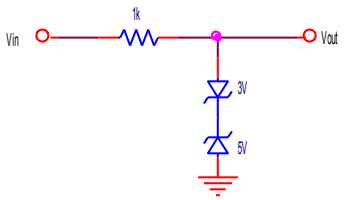
2. If a $10V_{pk}$ 1kHz sinusoid is applied as Vin, sketch Vout for each of the circuits below

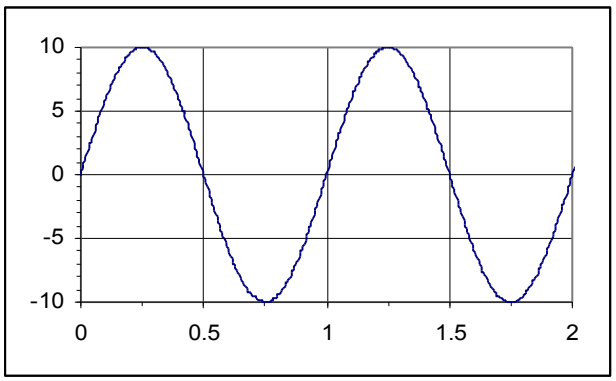
a.





b.





3. Design a full wave rectifier circuit to convert 60Hz, $120V_{RMS}$ AC into $12V_{DC}$ with < 0.5V ripple. Assume a load resistance of 10k□.