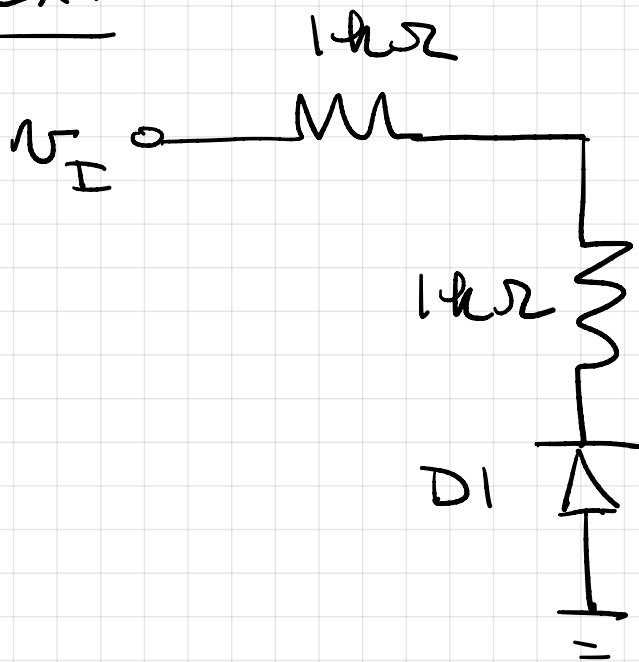


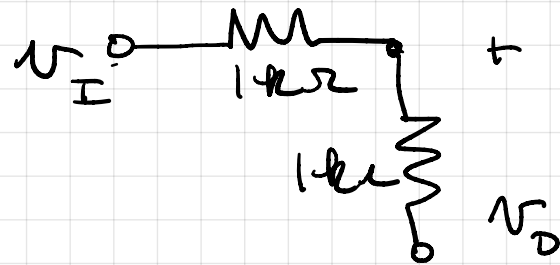
EX 1

Find & plot v_o



v_o

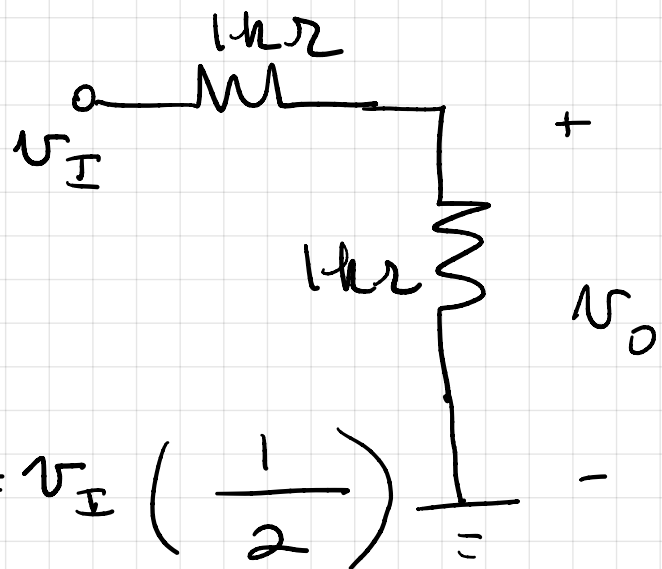
$v_I > 0$
DI OFF



$v_o = v_I$

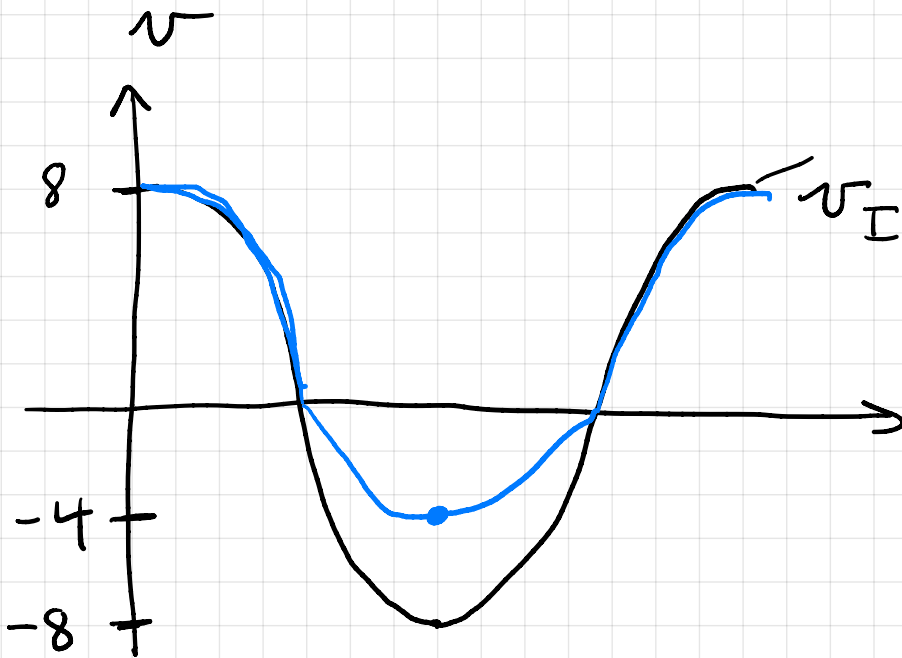
$v_o = v_I$

$v_I < 0$



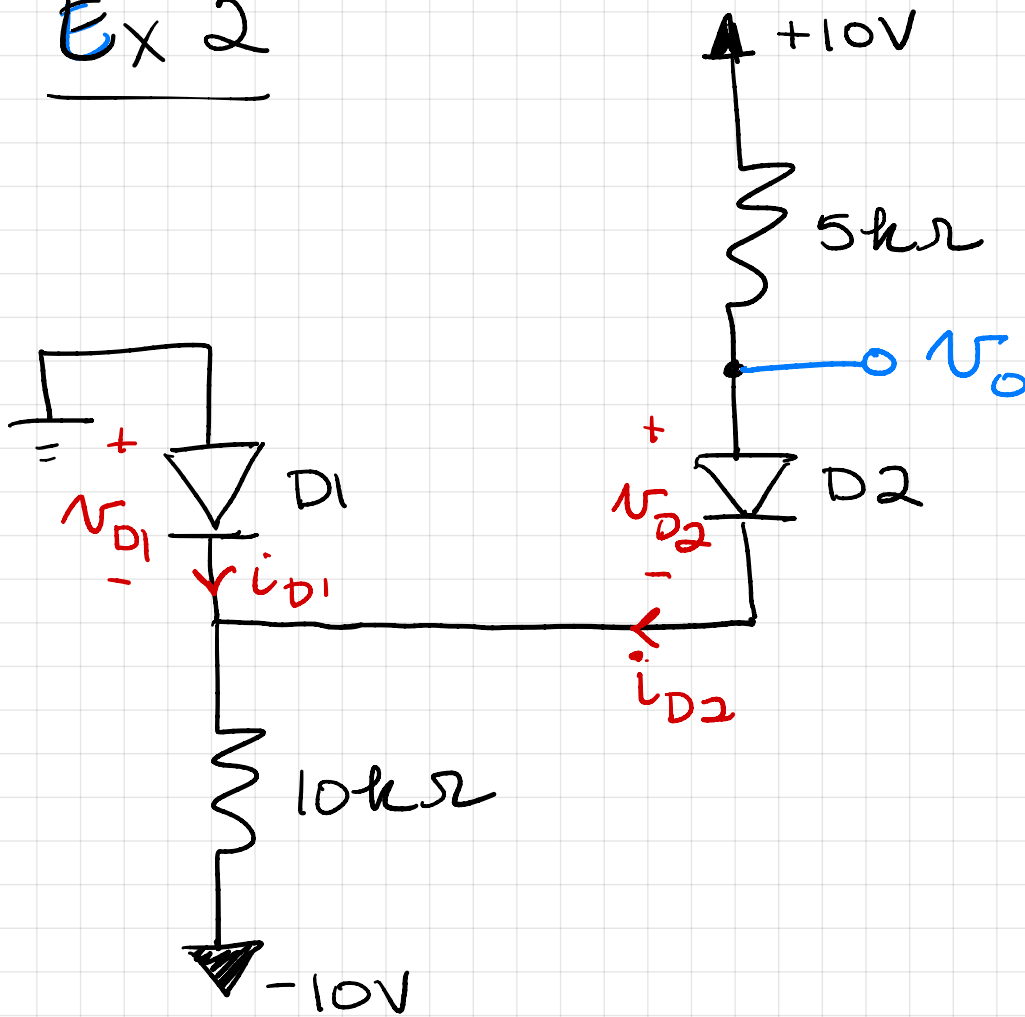
$$v_o = v_I \left(\frac{1}{2} \right)$$

$$v_o = \frac{1}{2} v_I$$



Ex 2

Solve v_o .



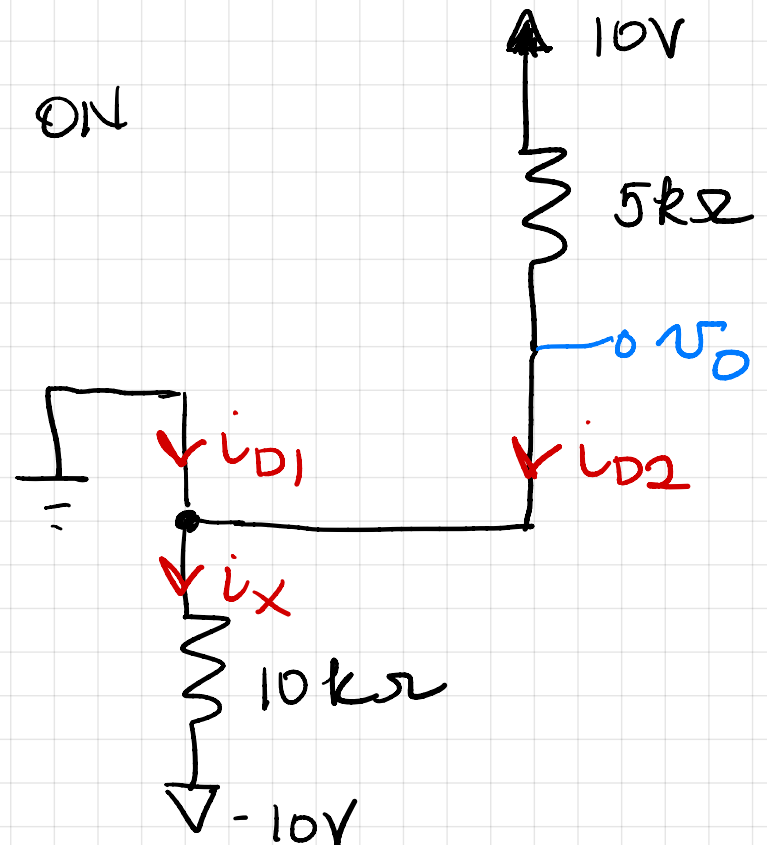
Start D_1 & D_2 ON

$$i_{D1} > 0, i_{D2} > 0$$

$$i_{D2} = \frac{10 - 0}{5k\Omega}$$

$$i_{D2} = 2mA$$

$$i_x = \frac{0 - (-10)}{10k}$$



$$i_x = 1\text{mA}$$

by KCL

$$i_{D1} + i_{D2} = i_x$$

$$i_{D1} = i_x - i_{D2}$$

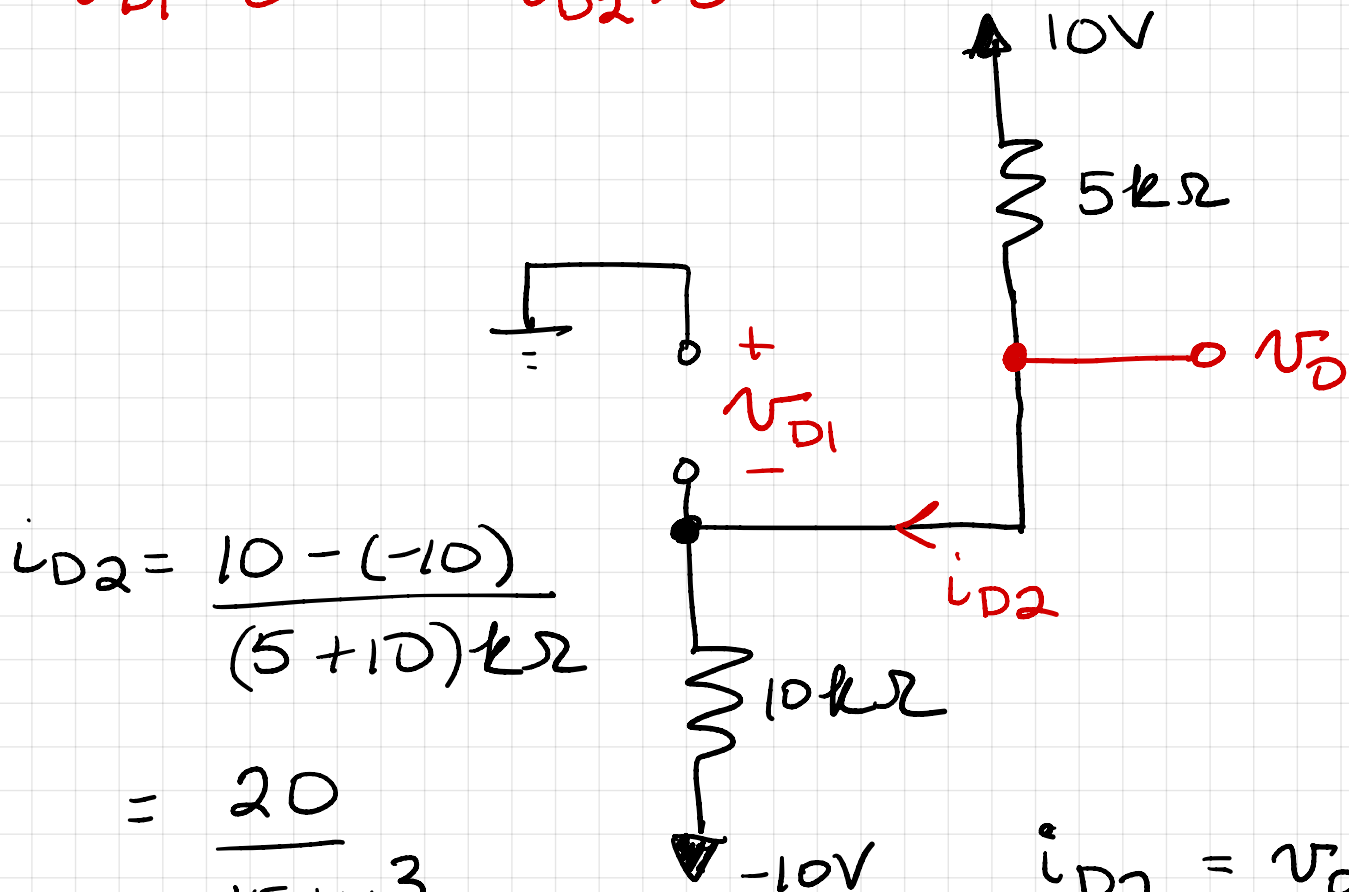
D1 & D2 are not both on.

$$i_{D1} = -1\text{mA}$$

D1 OFF & D2 ON

$$v_{D1} < 0$$

$$v_{D2} > 0$$



$$i_{D2} = \frac{10 - (-10)}{(5 + 10)\text{k}\Omega}$$

$$= \frac{20}{15 \times 10^3}$$

$$i_{D2} = 1.33\text{mA}$$

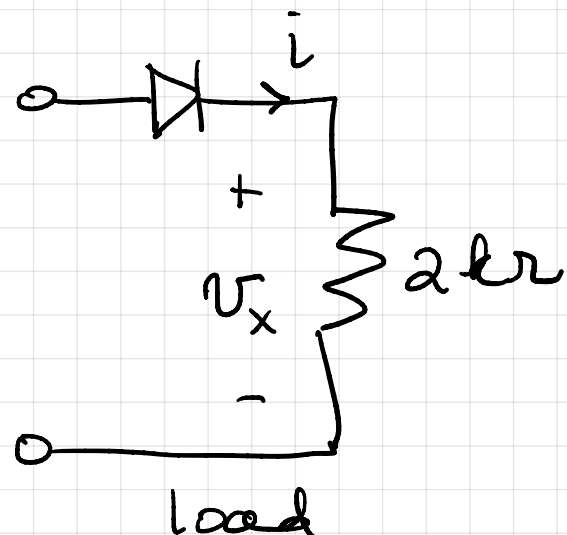
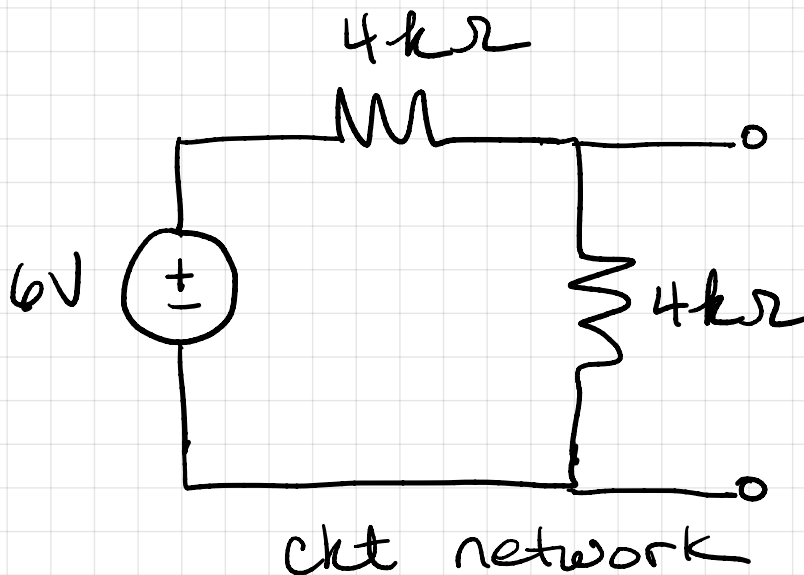
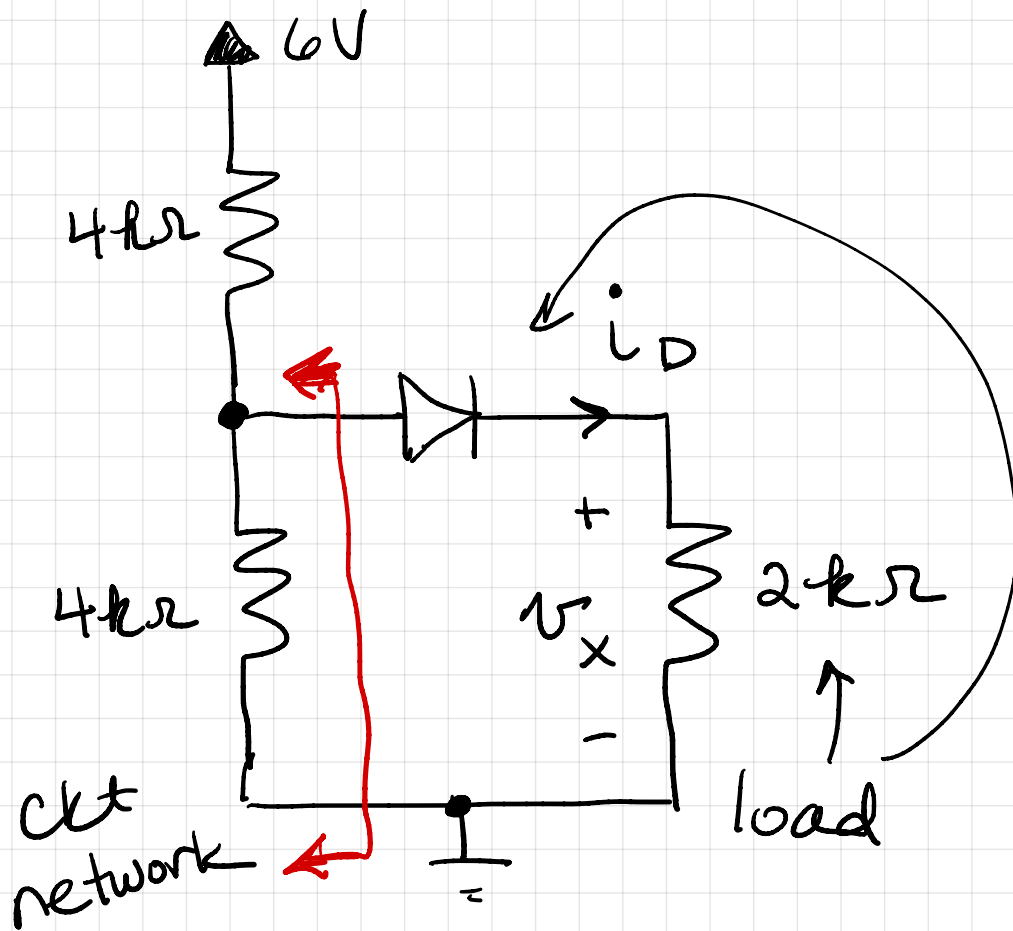
$$i_{D2} = \frac{v_o - (-10)}{10 \times 10^3}$$

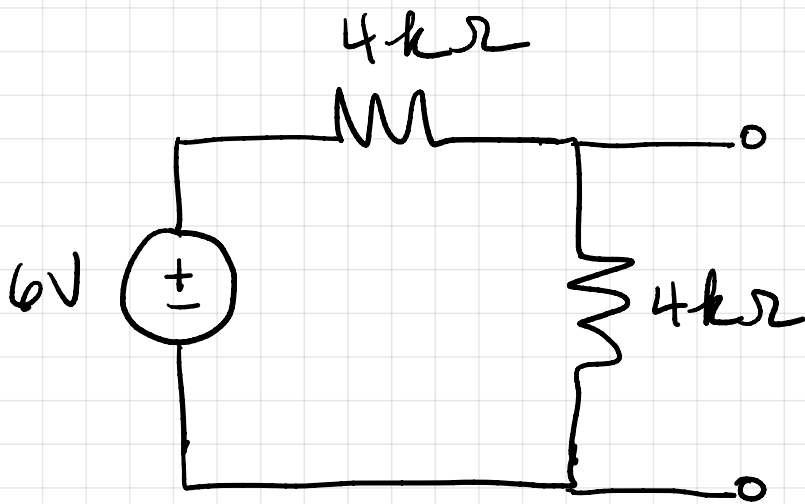
$$= 1.33\text{mA}$$

$$v_o = 3.33\text{V}$$

$$v_{D1} = 0 - v_o$$

$$v_{D1} = -3.33V$$





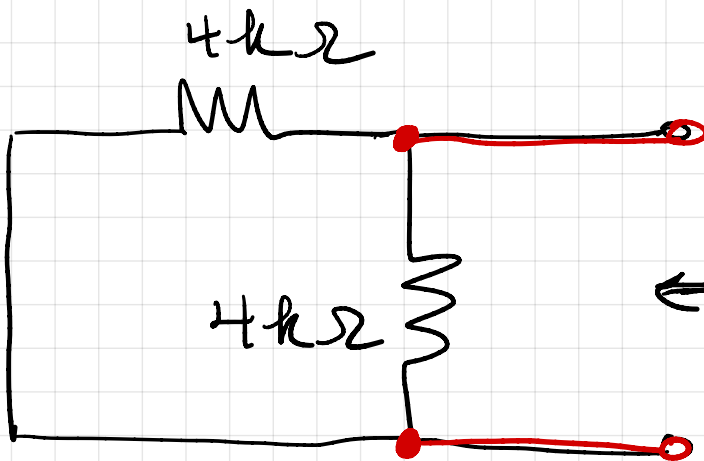
+
 V_{OC}
 -

$$V_{TH} = V_{OC}$$

$$V_{OC} = 6 \left(\frac{4}{8} \right)$$

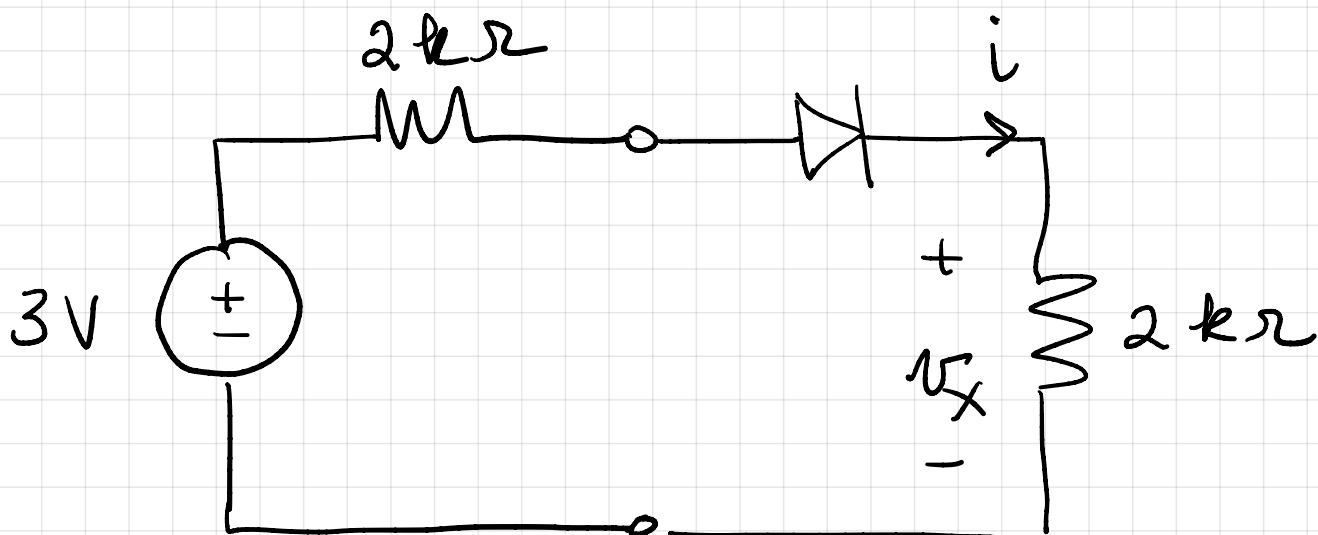
$$= 3V$$

$$V_{TH} = 3V$$



$$\leftarrow R_{eq} = R_{TH}$$

$$R_{TH} = (4 || 4) k\Omega = 2 k\Omega$$



Assume diode is on.

$$v_x = 3 \left(\frac{2 \times 10^3}{4 \times 10^3} \right)$$

$$v_x = 1.5 \text{ V}$$

$$i_x = \frac{v_x}{2 \times 10^3}$$

$$i_x = \frac{1.5}{2 \times 10^3}$$

$$i_x = 0.75 \text{ mA}$$