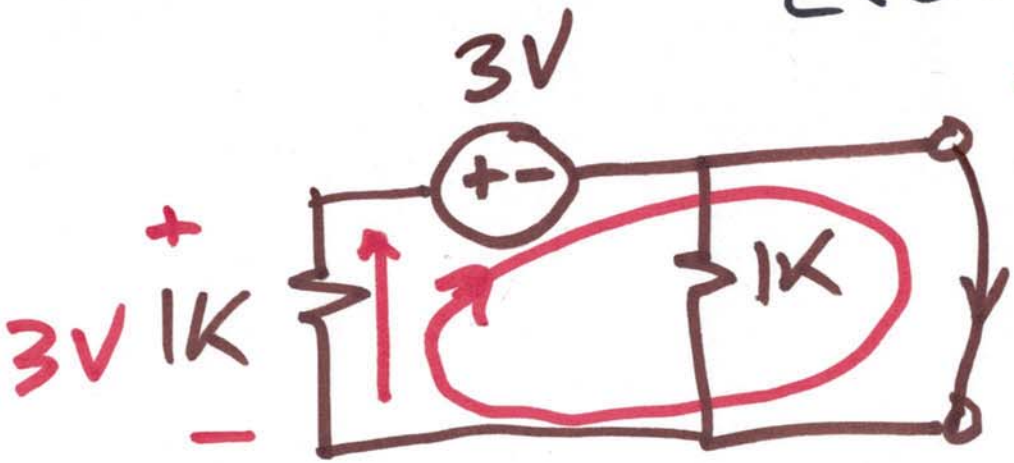
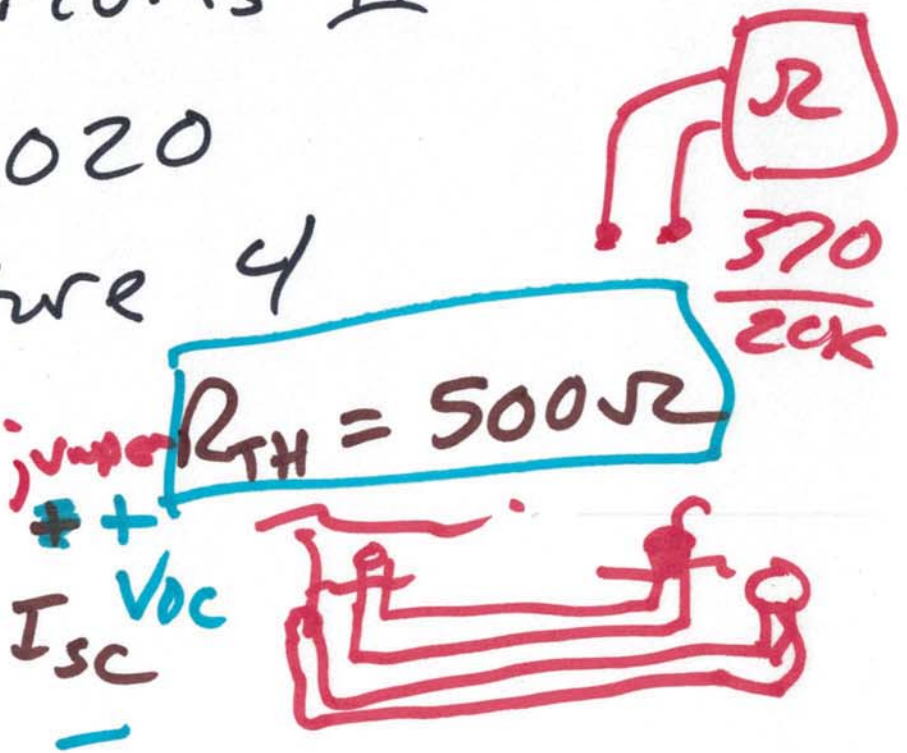
EE 221 Circuits II

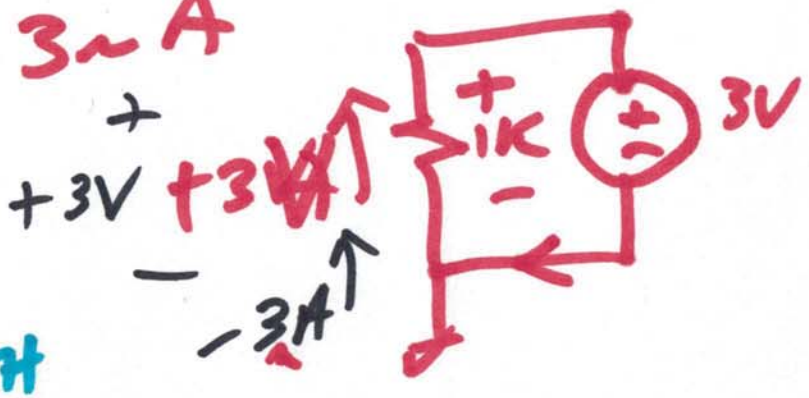
Feb. 3, 2020

Lecture 4



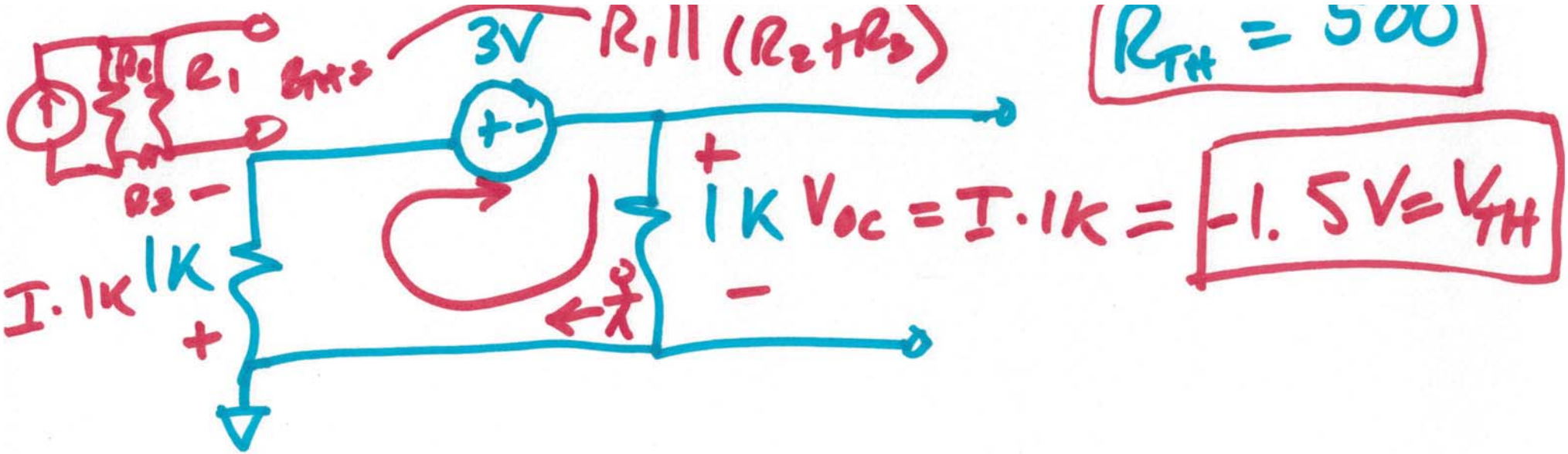


$$I_{SC} = -3\text{m}A$$



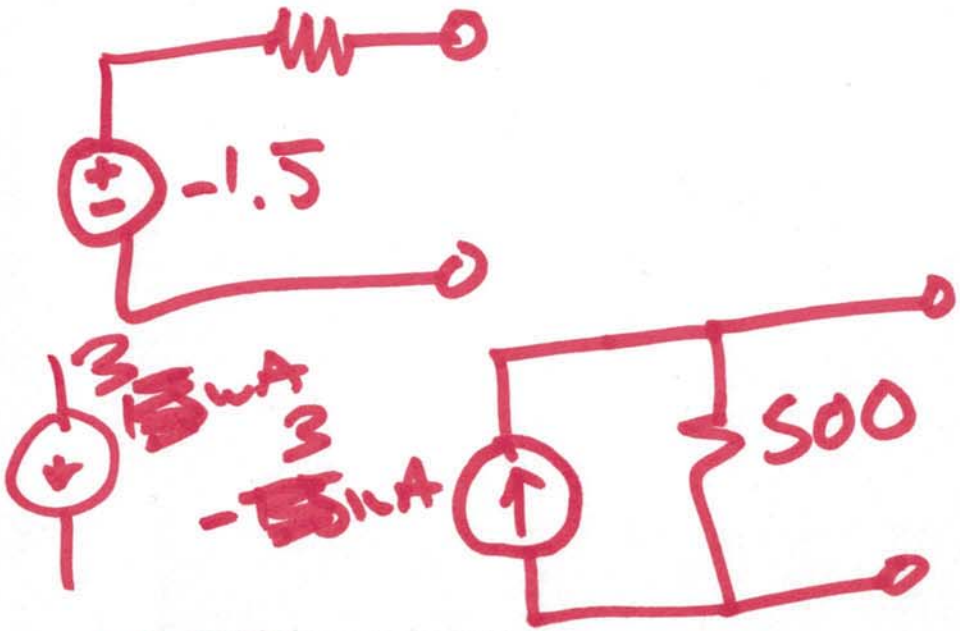
$$V_{OC} = 500 \cdot -3\text{m}A$$

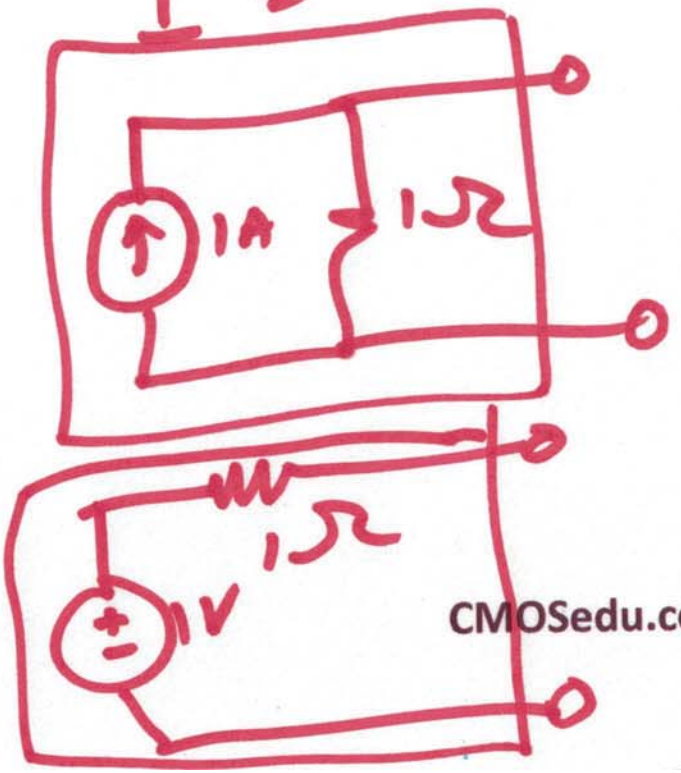
$$= -1.5V = V_{TH}$$

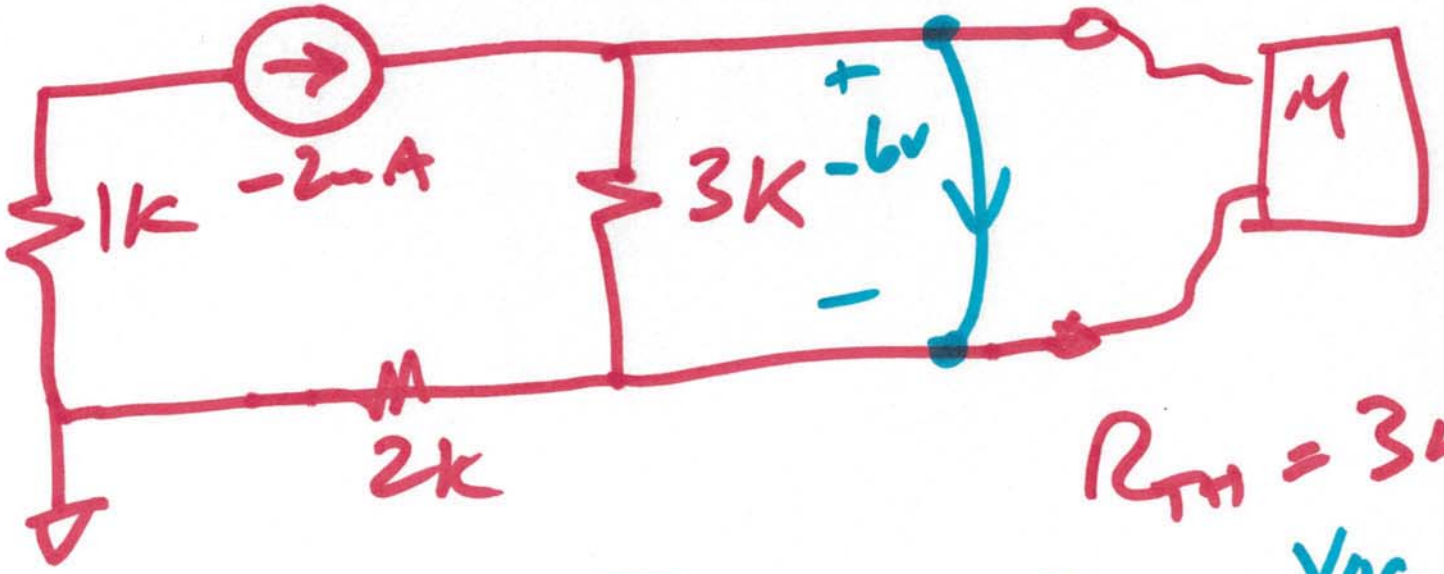


$$500 - I \cdot 1K - 3 - I \cdot 1K = 0$$

$$I = -1.5\,mA$$

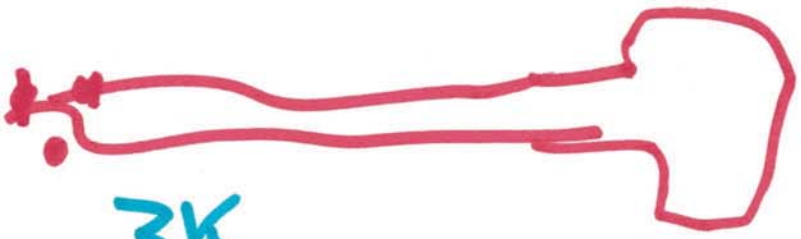


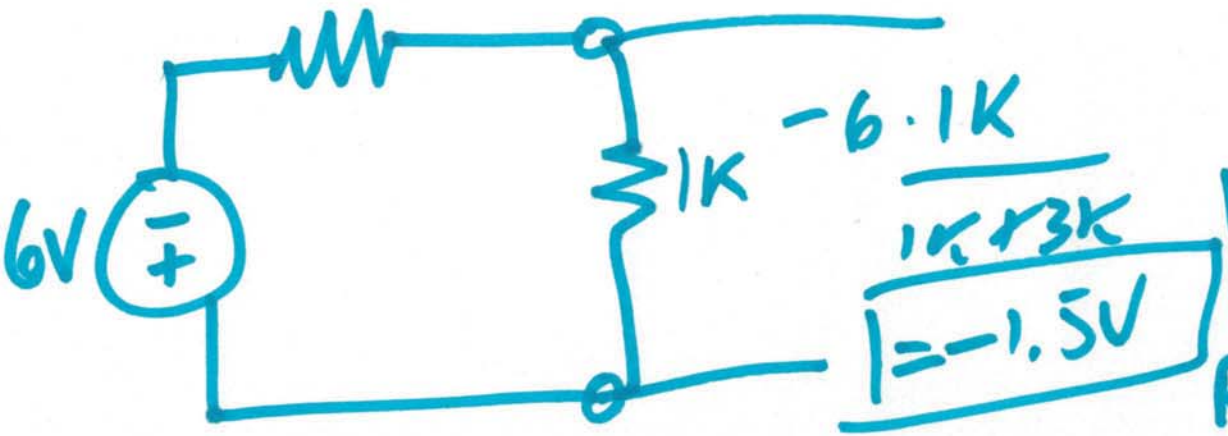




$R_{TH} = 3K$

$R_{TH} = \frac{V_{OC}}{I_{SC}} = \frac{V_{TH}}{I_{TH}}$

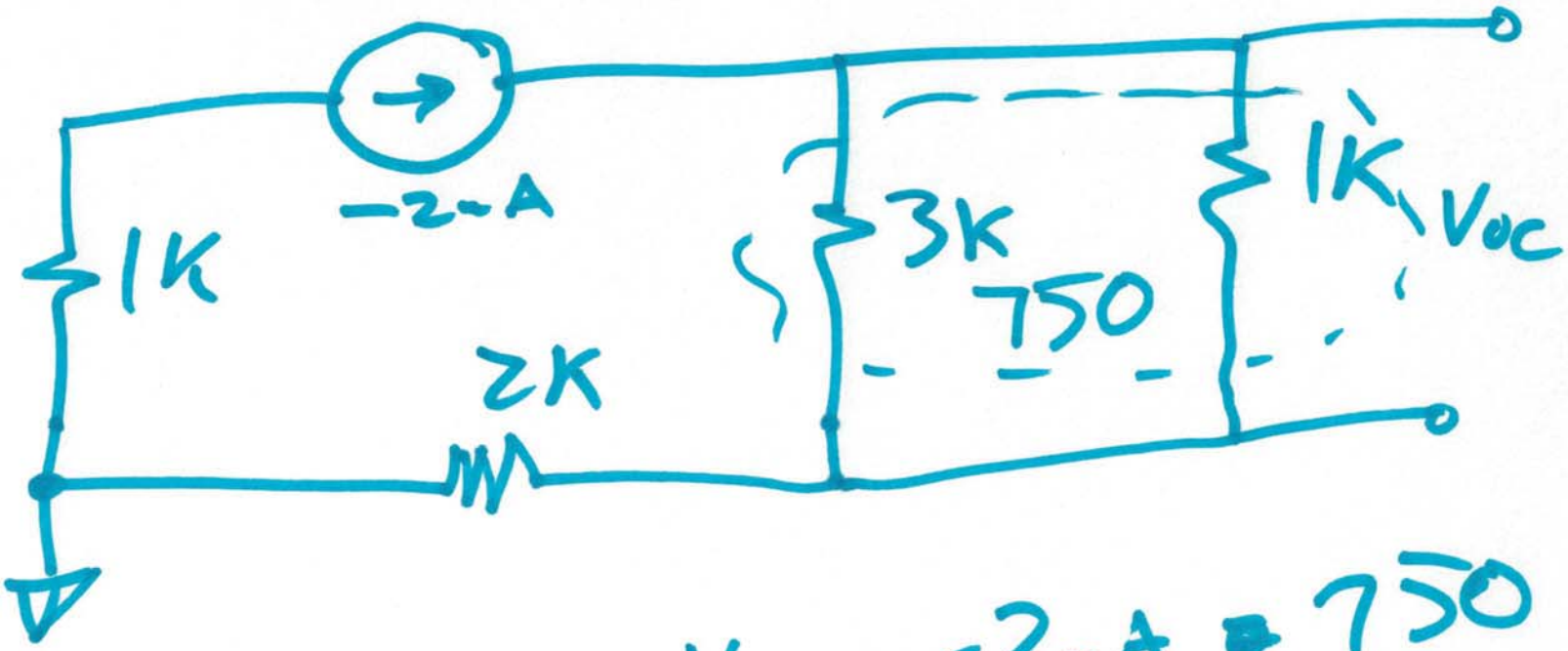




$I_{SC} = -2mA$

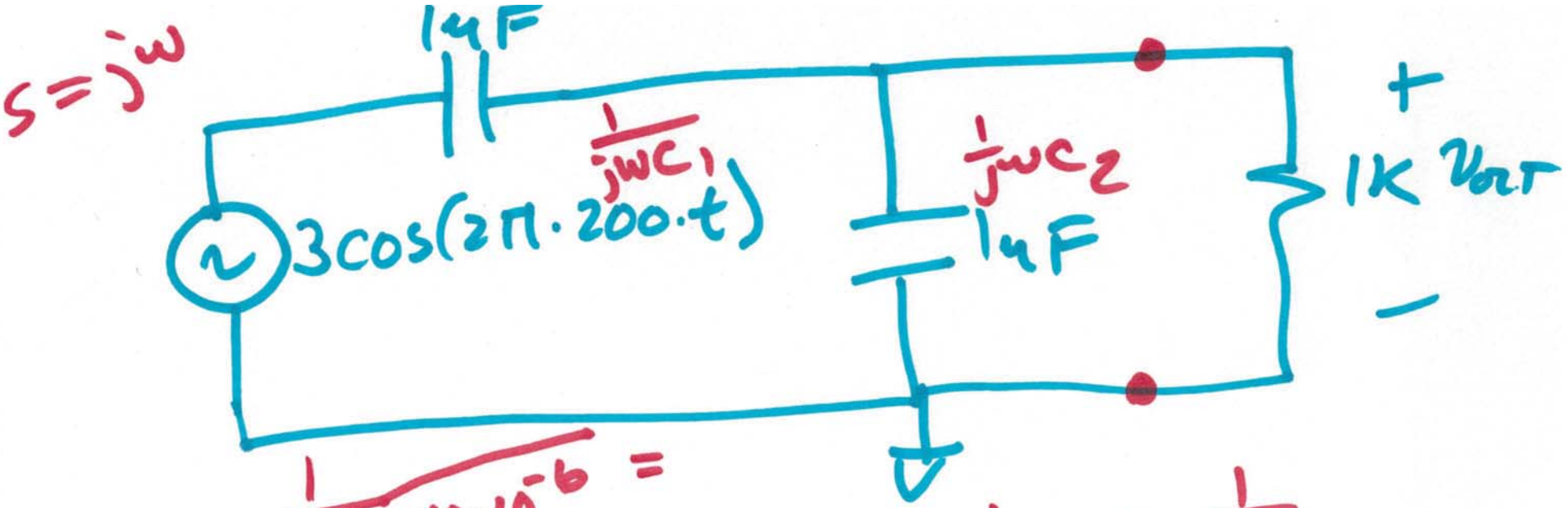
$V_{OC} = -6V$

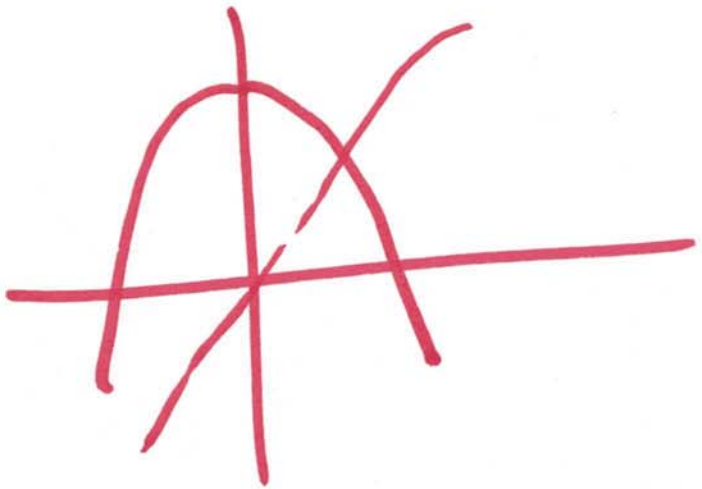
$R_{TH} = \frac{-6}{-2mA} = 3K$



$V_{OC} = -2\text{A} \cdot 750$

$= -1.5\text{V}$

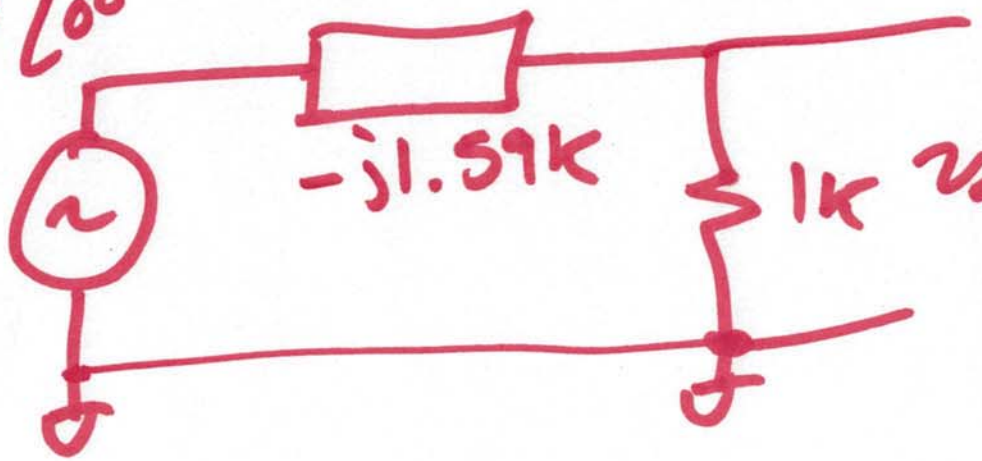




$$Z_{TH} = \frac{1}{jwC_1} + \frac{1}{jwC_2}$$

$$= -j(796 + 796)$$

$$Z_{TH} = -j\,1{,}592$$



$T\Big|_{f=200Hz} = 5ms$

$v_{out} = \dfrac{3\angle 0 \cdot 1K}{1K + j(-1.59K)}$

t_{out}^{-1} IN RP

$= \dfrac{3{,}000\angle 0°}{1.88K\angle -58°}$

$\dfrac{t_d}{T} \cdot 360 = 58°$

$t_d = \dfrac{58}{360} \cdot 5ms$

$= 0.8ms$

$v_{out} = 1.6\angle 58°$

$v_{out} = 1.6\cos(2\pi \cdot 200 \cdot t + 58)$