EE 220: Circuits 1

- 0 • Ohm's Law (Power)
- 0 • series & parallel equivalents
- ★ a lot • KVL, KCL ✓
- ★ 6 • Nodal analysis
- ★ 5 • voltage, current dividers
- ★ lots • superposition, mesh analysis
- ★ lots • Thevenin & Norton
- ★ 5 • source transformation
- 0 • power dissipation
- ★ 5 • dependent sources ✓

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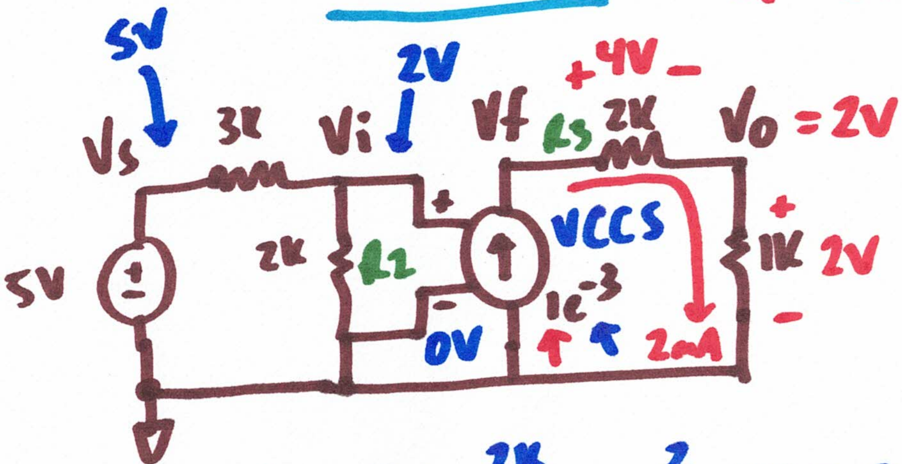
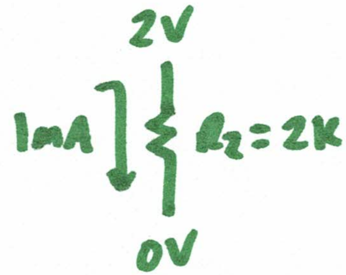
Quiz #9

$V_f = 6V$



$$V_i = 5V \cdot \frac{2K}{5K} = \frac{2}{5} \cdot 5V = 2V$$

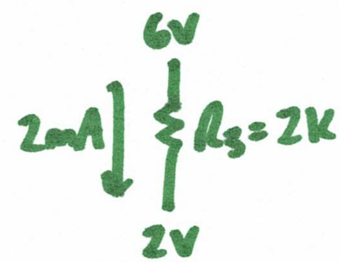
$$I(s) = 2 \cdot [1 \cdot 10^{-3}] = 2mA$$



$P(R_2) = 2V \cdot 1mA$

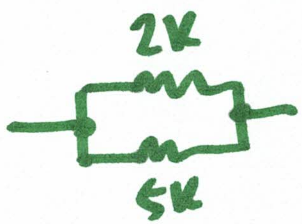
$\boxed{P(R_2) = 2mW}$

X



$P(R_3) = 4V \cdot 2mA$

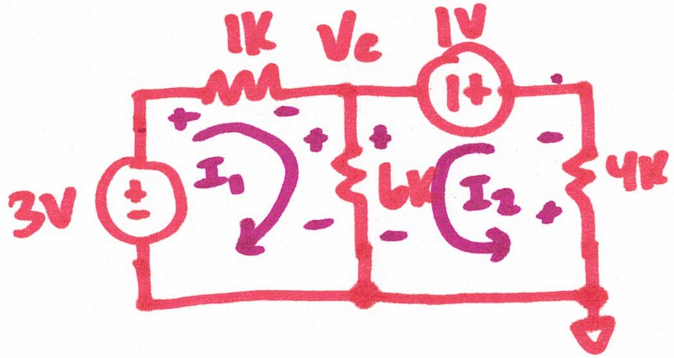
$\boxed{P(R_3) = 8mW}$



↓

$2K // 5K = 1.2K$

HW6:1C



① $+3V - I_1 \cdot 1K - (I_1 + I_2) \cdot 6K = 0 \rightarrow 3V - I_1 \cdot 1K - I_1 \cdot 6K - I_2 \cdot 6K = 0$

$3V - I_1 7K - I_2 \cdot 6K = 0$

$\frac{3V - I_1 \cdot 7K}{6K} = \frac{I_2 \cdot \cancel{6K}}{\cancel{6K}}$

② $-1V - (I_1 + I_2) \cdot 6K - I_2 \cdot 4K = 0$

$-1V - I_1 \cdot 6K - I_2 \cdot 6K - I_2 \cdot 4K = 0$

$-1V - I_1 \cdot 6K - I_2 \cdot 10K = 0$

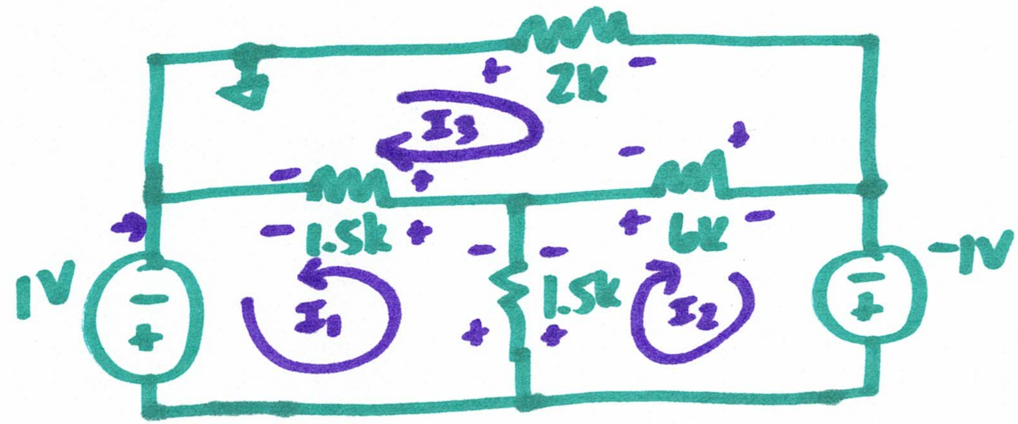
$\frac{-1V - I_2 \cdot 10K}{6K} = \boxed{I_1 = -0.1667mA - 1.667 I_2}$

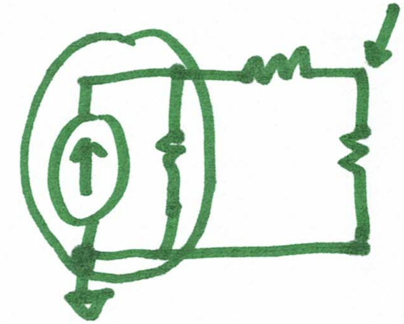
~~0.5V~~

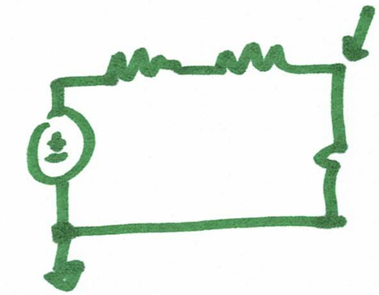
$\boxed{0.5mA - 1.167 I_1 = I_2}$

$0.5mA - 1.167 I_1$

BAKER ~~SP~~ F. 21, HW8.26



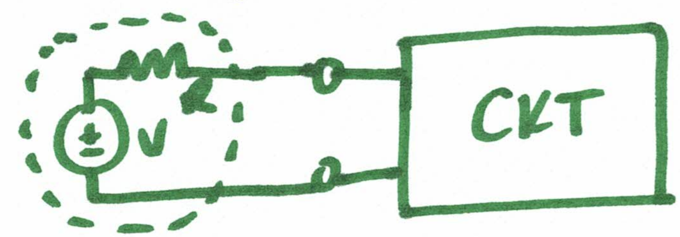


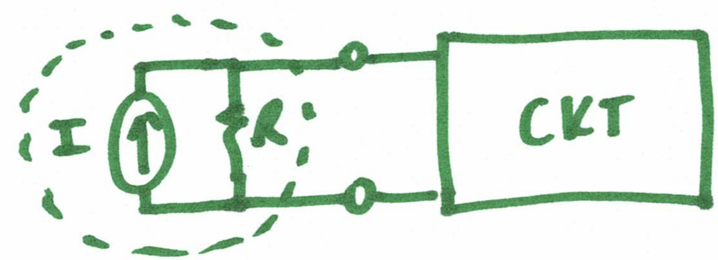


① $+1V - (I_1+I_2)\cdot 1.5K - (I_1+I_3)\cdot 1.5K = 0$

② $-1V - (I_1+I_2)\cdot 1.5K - (I_2-I_3)\cdot 6K = 0$

③ $-I_3\cdot 2K - (I_3-I_2)\cdot 6K - (I_1+I_3)\cdot 1.5K = 0$





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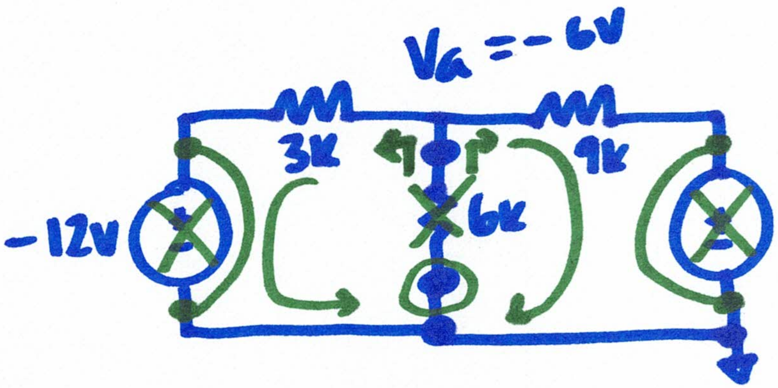
HW8: 1A



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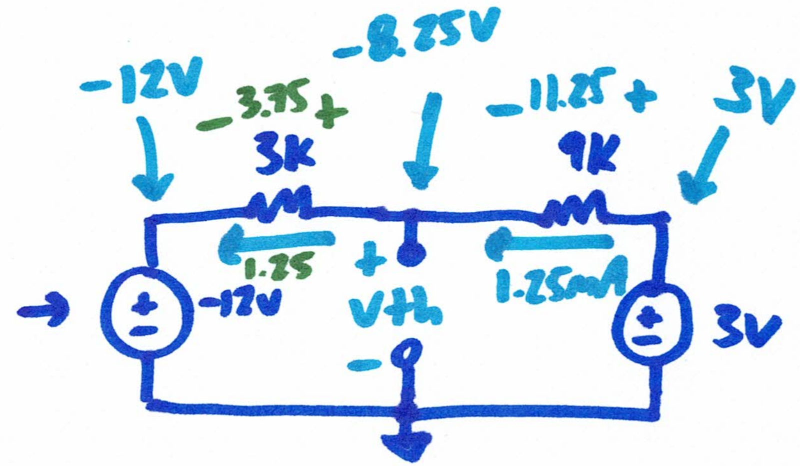
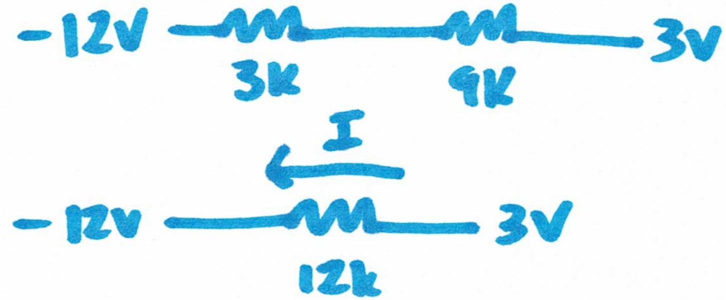




$I = V/R$

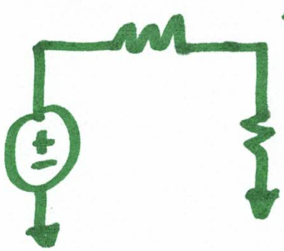
$I_N = V_{th}/R_{th}$

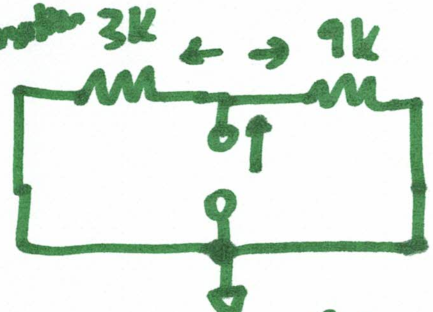
$$I_N = \frac{-8.25V}{2.25K}$$

$$V_{th} = -8.25V$$

$$V_{th} = -8.25V$$

Source transformation





$$I = \frac{3V - (-12V)}{12K} = \frac{15V}{12K}$$

$$I = 1.25mA$$

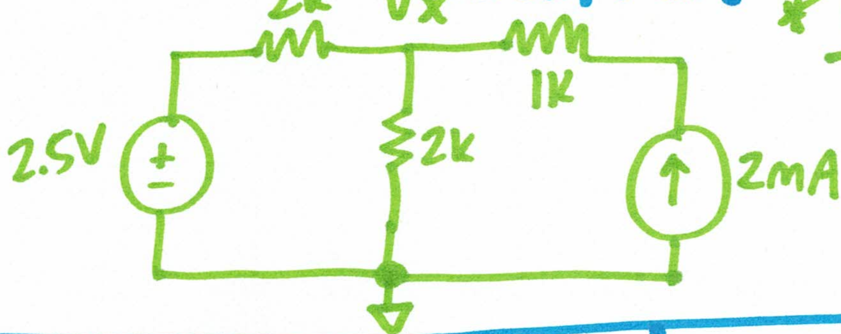
$$R_{th} = 3K // 9K = \frac{3K \cdot 9K}{3K + 9K} =$$

$$R_{th} = 2.25K$$

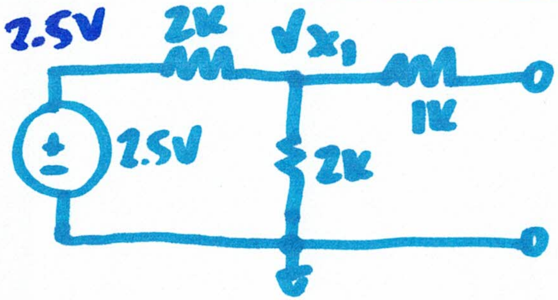
BAKER EE220 F21 MT, p.2

$V_x = V_{x_1} + V_{x_2}$

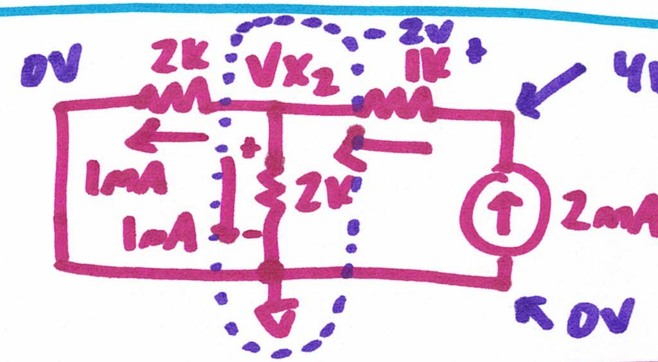
* use superposition



$$V_x = 1.25V + 2V = 3.25V$$

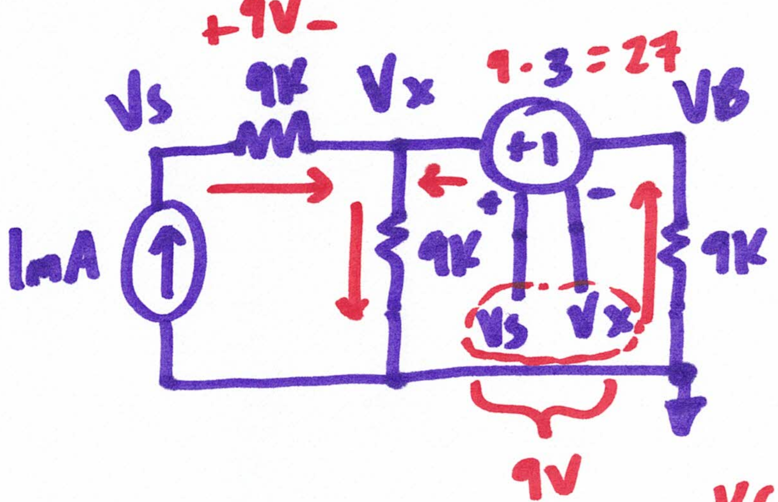


$$V_{x_1} = 2.5V \cdot \frac{2K}{4K} = 1.25V = V_{x_1}$$



$$V_{x_2} = 1mA \cdot 2K = 2V = V_{x_2}$$

BAKER MT Sp.17, P.6



$$\boxed{V_x = V_B + 27V}$$

1mA

$$\text{KCL: } \frac{0 - V_B}{9K} + \frac{V_S - V_x}{9K} = \frac{V_x}{9K}$$

$$\boxed{\frac{-V_B}{9K} + 1mA = \frac{V_x}{9K}}$$