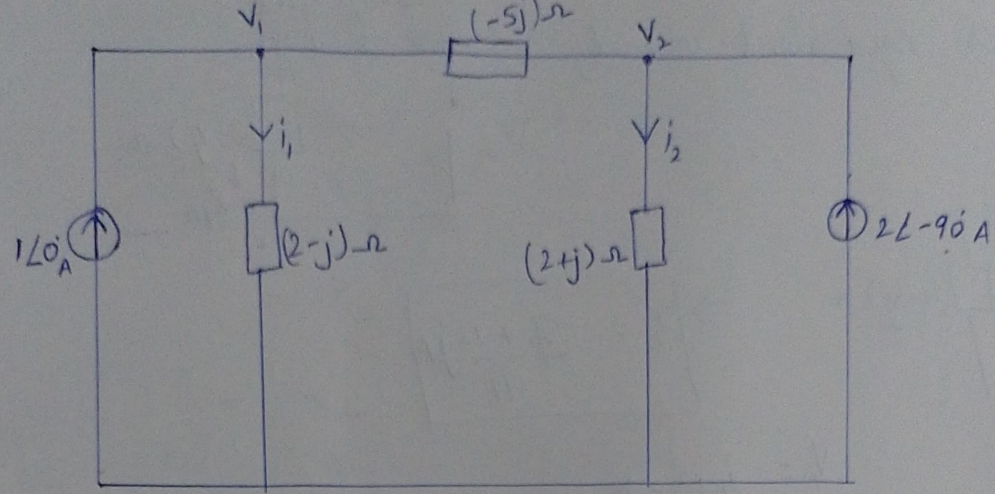
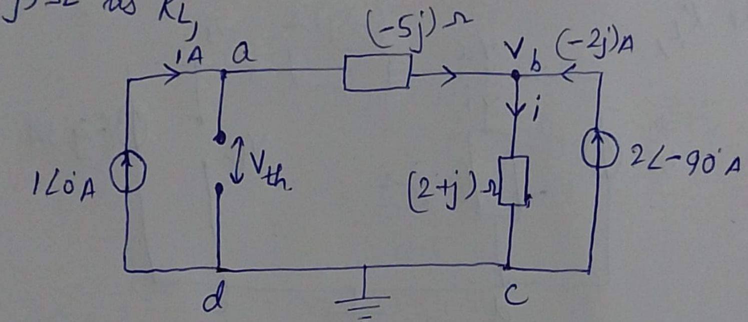


Sol^n :-

① Thevenin's Theorem

considering $(2-j)\,\Omega$ as R_L,



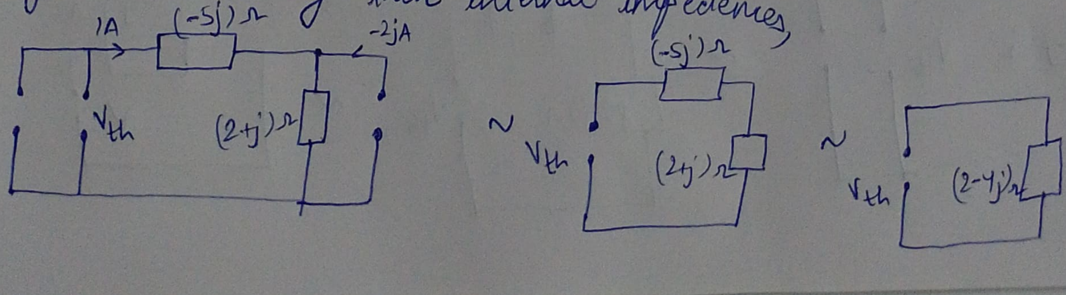
Using KCL at b,

$i = (1-2j)\,A$

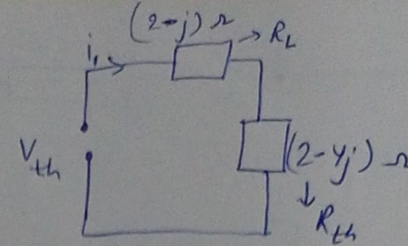
$$\frac{0-V}{2+j} = 1-2j \Rightarrow V = -4+3i$$

$$\frac{V-V_{th}}{-5j} = 1 \Rightarrow \boxed{V_{th} = -4+8j}$$

Replacing all sources by their internal impedences,



Thevenin's equivalent circuit,



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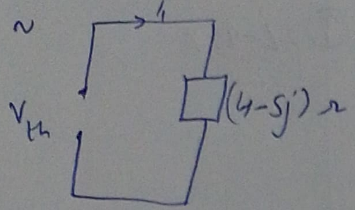
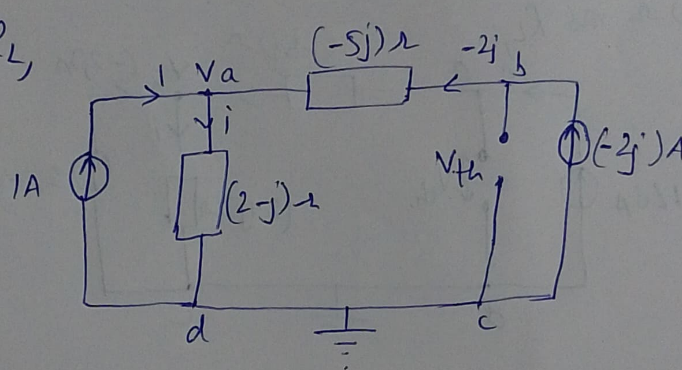


$$\Rightarrow \boxed{i_1 = \frac{-56+12j}{41}\,A}$$

$$V_1 = i_1(2-j)$$

$$\Rightarrow \boxed{V_1 = \frac{-100+80j}{41}\,V}$$

Considering $2+j$ as R_L,



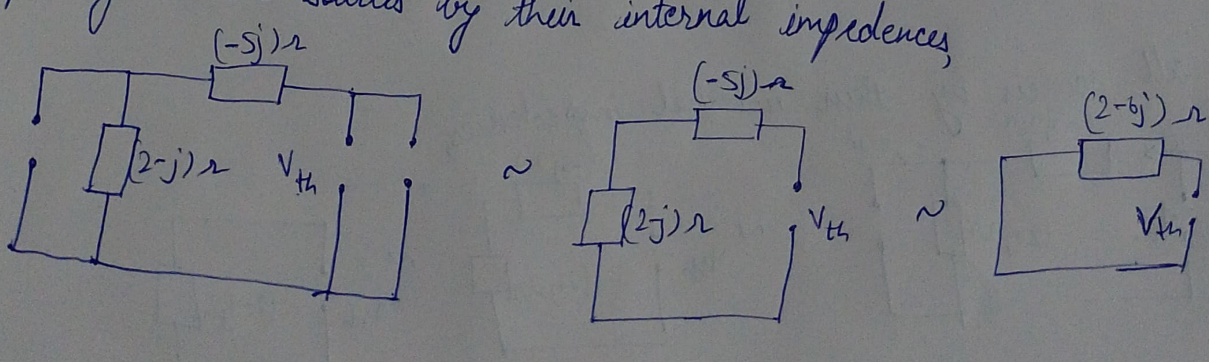
using KCL at a,

$$\underline{i = 1-2j}$$

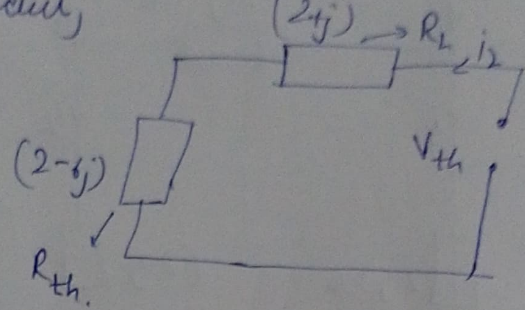
$$\frac{0-V}{2-j} = 1-2j \quad \Rightarrow \underline{V = 5j}$$

$$\frac{V_{th}-V}{-5j} = -2j \quad \Rightarrow \boxed{V_{th} = -5j-10}$$

Replacing all the sources by their internal impedences,



Thevenin's equivalent circuit,



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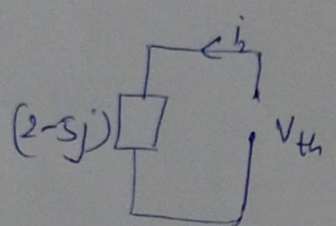
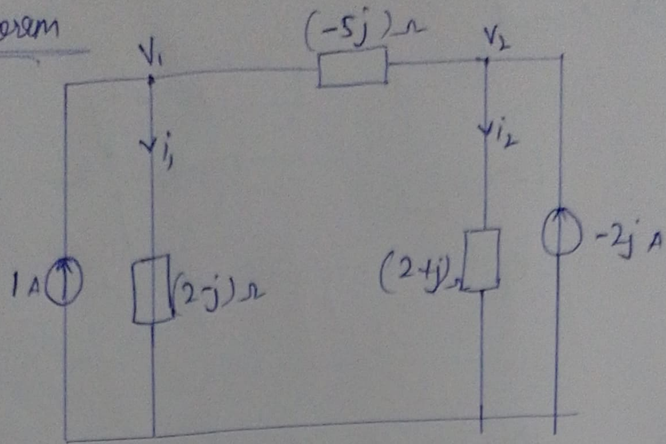


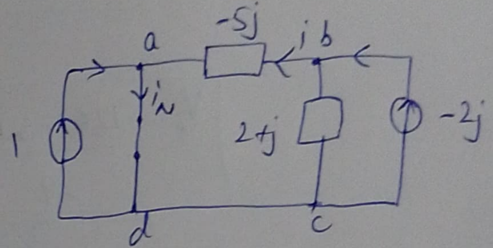
$$\Rightarrow \boxed{i_2 = \frac{40-45i}{29}\ A}$$

$$\boxed{V_2 = \frac{125-50i}{29}\ V}$$

2 Norton's Theorem



Considering (2-j) as R_L,

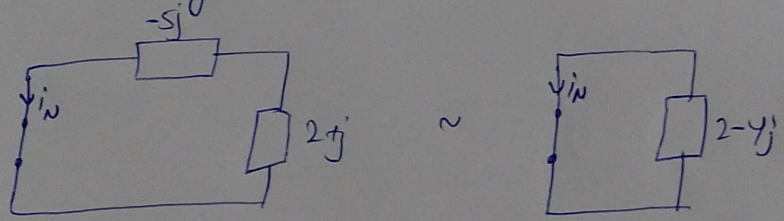


Using current divison rule, at b,

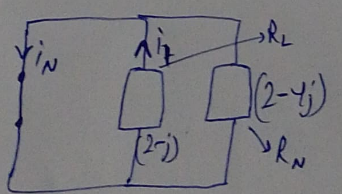
$$i = (-2j)\left(\frac{2+j}{2-4j}\right)$$

$\Rightarrow$ $i = 1\,A$ $\quad$ $\therefore$ $\boxed{i_N = 2A}$

Replacing all sources by their internal impedences,



Norton's equivalent circuit,



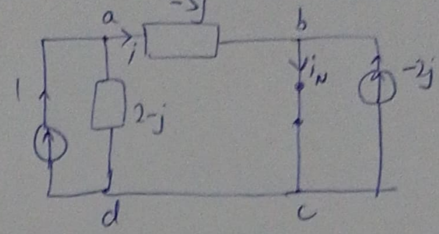
current through R_L $\Rightarrow$ $i_1 = 2\left(\frac{2-4j}{4-5j}\right)$

$$\Rightarrow \boxed{i_1 = \frac{-56+12j}{40}\ A}$$

$V_1 = i_1(2-j)$

$$\Rightarrow \boxed{V_1 = \frac{-100+80j}{41}\ V}$$

Considering $(2+j)$ as R_L,

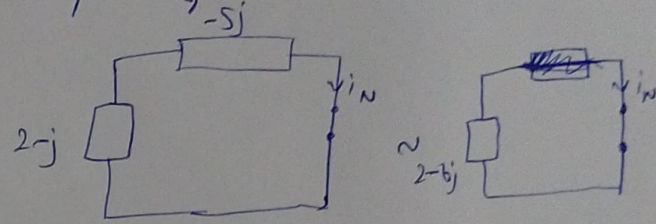


Applying current divison rule at a,

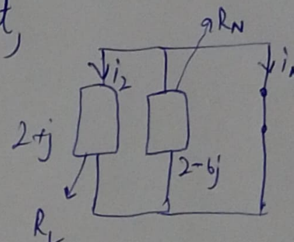
$$i = 1\left(\frac{2-j}{2-6j}\right) \Rightarrow i = \frac{1+j}{4}$$

$$\Rightarrow \boxed{i_N = \frac{i-7j}{4}}$$

Replacing all sources with their internal impedences,



Norton's equivalent circuit,



current through R_L, $i_2 = \left(\frac{1-7j}{4}\right)\left(\frac{2-6j}{2-5j}\right)$

$$\Rightarrow \boxed{i_2 = \frac{40-45i}{29} A}$$

$$V_2 = (2+j)(i_2)$$

$$\Rightarrow \boxed{V_2 = \frac{125-50i}{29} V}$$