Circuit & Electronic
Group9

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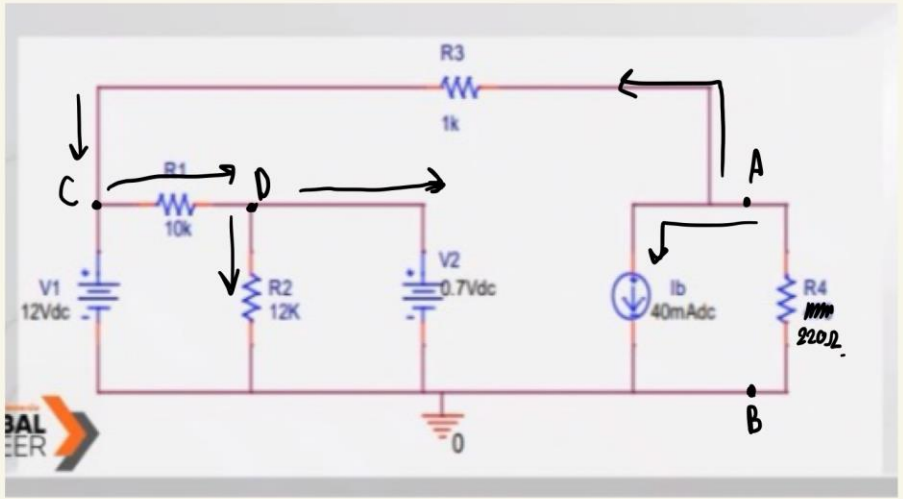
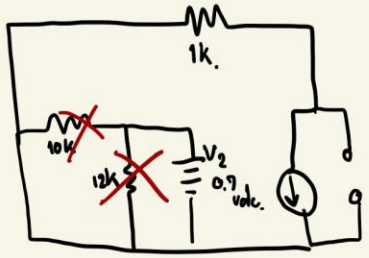


find V_{R4}.

$R_{th.} = R_3 = 1000\,\Omega.$



$V_{th.}$

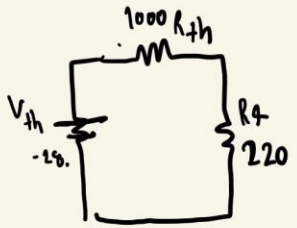
(A). $\frac{V_A - V_C}{1k} + 40m = 0.$ $\quad (\frac{1}{1k})V_A + (-\frac{1}{1k})V_C = 0.04$

(C) $(V_C - 12) + \left(\frac{V_C - V_D}{10k}\right) + \frac{V_C - V_A}{1k} = 0.$ $\quad (-\frac{1}{1k})V_A + (1 + \frac{1}{10k} + \frac{1}{1k})V_C + (-\frac{1}{10k})V_D = 12$

(D) $\frac{V_D - V_C}{10k} + \frac{V_D}{12k} - V_D - 0.7 = 0.$ $\quad (-\frac{1}{10k})V_C + (\frac{1}{10k} + \frac{1}{12k} + 1)V_D = 0.7 \quad -(3).$

$$\begin{bmatrix} \frac{1}{1k} & -\frac{1}{1k} & 0 \\ -\frac{1}{1k} & 1+\frac{1}{10k}+\frac{1}{1k} & -\frac{1}{10k} \\ 0 & -\frac{1}{10k} & 1+\frac{1}{10k}+\frac{1}{12k} \end{bmatrix} \begin{bmatrix} V_A \\ V_C \\ V_D \end{bmatrix} = \begin{bmatrix} 0.04 \\ 12 \\ 0.7 \end{bmatrix}$$

$V_A = -28V.$



$V_{R4} = I_{R4} \cdot R_4 = \left(\frac{-28}{1000+220}\right)220$

$= -5.099V.$

Editor - C:\Users\billy\Documents\MATLAB\bruh3.m

Untitled.m | Untitled2.m | lab.m | Untitled3.m | bruh.m | bruh2.m | bruh3.m

```
1 -    clear all;
2 -    clc;
3
4 -    R1=10000;
5 -    R2=12000;
6 -    R3=1000;
7 -    R4=220;
8 -    V1=12;
9 -    V2=0.7;
10 -   Ib=0.04;
11
12 -   Rth=R3;
13 -   Vth=-28;
14 -   V4 (R4/(R4+Rth))*Vth
```

Command Window

```
V4 =

   -5.0492

fx >>
```

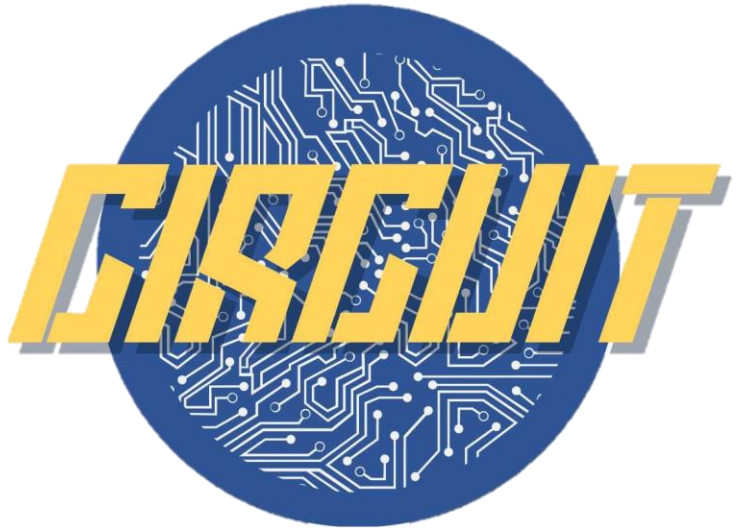
Editor - C:\Users\billy\Documents\MATLAB\bruh2.m

Untitled.m | Untitled2.m | lab.m | Untitled3.m | bruh.m | bruh2.m | bruh3.m

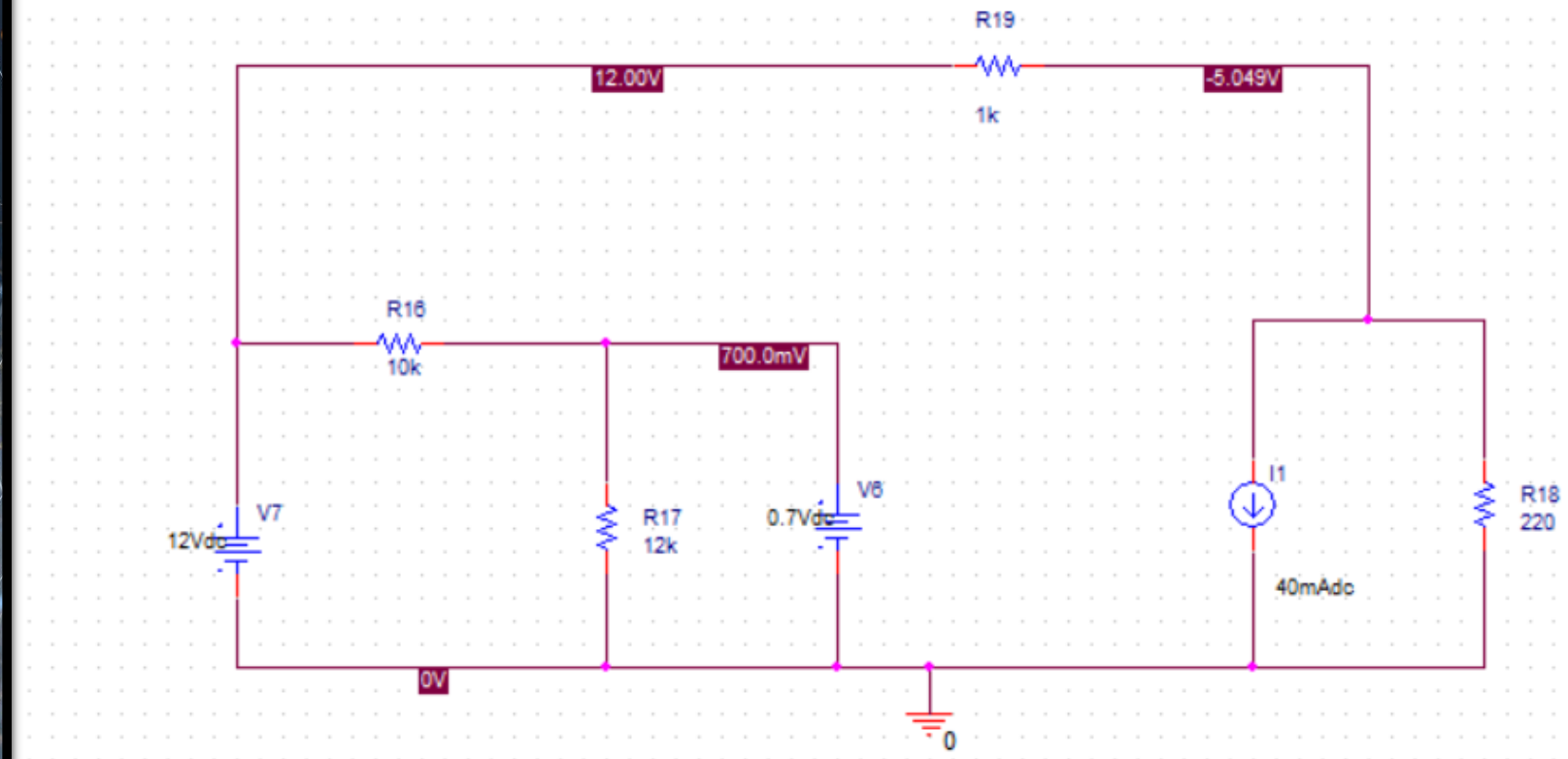
```
clear all,

clc;

R1=10000;
R2=12000;
R3=1000;
R4=220;
V1=12;
V2=0.7;
Ib=0.04;

d=[1+1/R1+1/R3 -1/R1 -1/R3;-1/R1 1+1/R1+1/R2 0;-1/R3 0 1/R3+1/R4]
a= [V1 -1/R1 -1/R3;V2 1+1/R1+1/R2 0;-Ib 0 1/R3+1/R4]
b=[1+1/R1+1/R3 V1 -1/R3;-1/R1 V2 0;-1/3 -Ib 1/R3+1/R4]
c=[1+1/R1+1/R3 -1/R1 V1;-1/R1 1+1/R1+1/R2 V2;-1/R3 0 -Ib]

Va=det (a) /det (d)
Vb=det (b)/det (d)
Vc=det (c) / det (d)
```

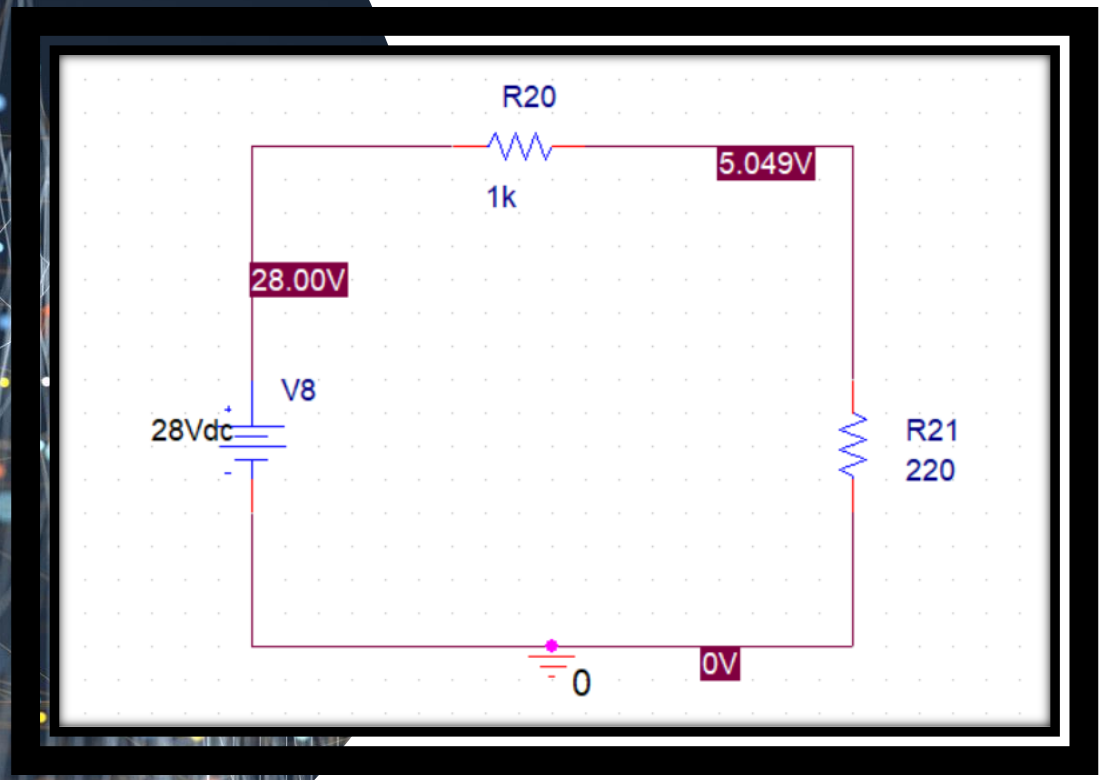
Command Window

```
    1.0011   -0.0001   12.0000
   -0.0001    1.0002    0.7000
   -0.0010         0   -0.0400


Va =

   11.9818


Vb =

    0.6592


Vc =

   -5.0525

>>
```



ตรวจสอบโดยใช้node


R19
12.00V
-5.049V
1k
R16
10k
700.0mV
V7
12Vdc
R17
12k
V6
0.7Vdc
I1
40mAdc
R18
220
0V
0


R20
1k
5.049V
28.00V
V8
28Vdc
R21
220
0
0V