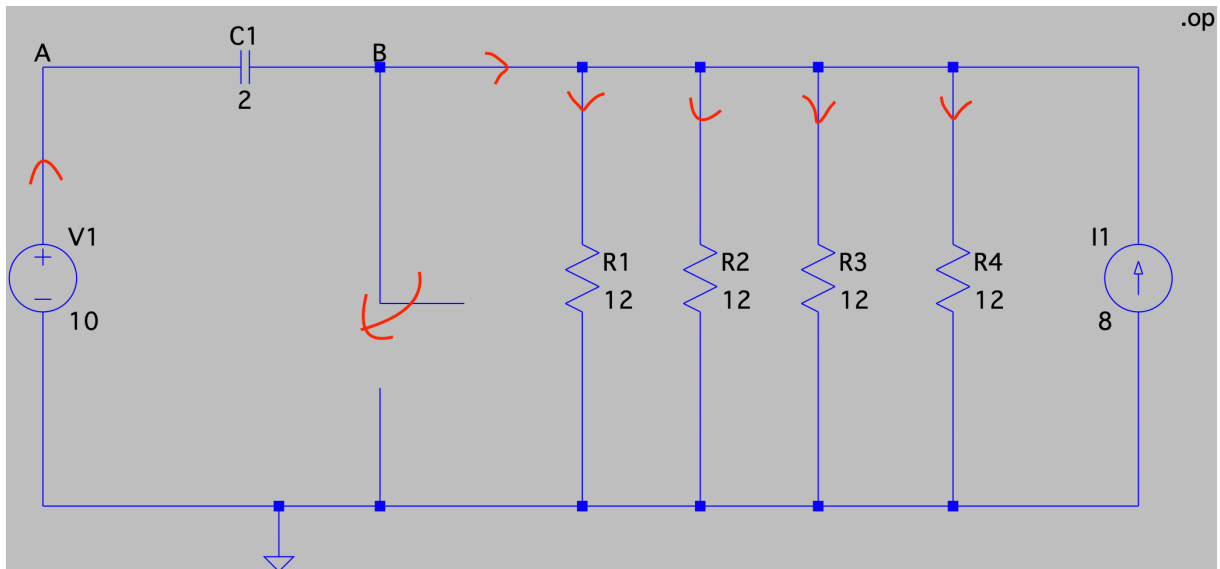
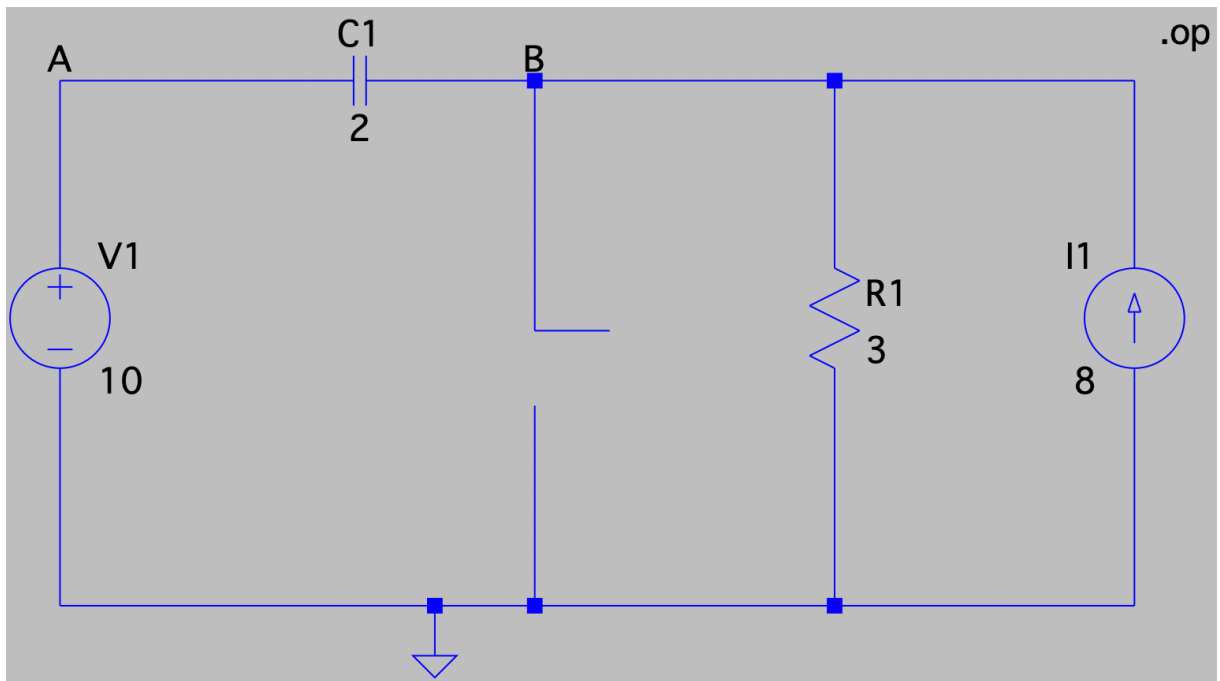


Travail 4 – circuits RC

Circuit de base



Circuit simplifié



Simplification du circuit

$$(12//12)/(12//12) = 6//6 = 3$$

Calcul de la tension et du courant

$$T < 0 \Rightarrow V_0 = 10 - (3 \times 8) = -14 \text{ V}$$

$$T = \infty \Rightarrow V_{\infty} = 10 \text{ V}$$

$$\tau = R_{eq} \cdot C = 3 \cdot 2 = 6 \text{ s}$$

$$v(t) = V_{\infty} + (V_0 - V_{\infty}) e^{-t/\tau}$$

$$v(t) = 10 + (-14 - 10) e^{-t/6}$$

$$v(t) = 10 - 24 e^{-t/6}$$

Log du circuit de base

```
---- Expanded Deck Component Count ----  
C's 1  
I's 1  
R's 4  
V's 1  
tot: 7
```

```
---- Expanded Netlist ----  
*  
c1 b a 2  
v1 a 0 10  
r1 b 0 12  
r2 b 0 12  
r3 b 0 12  
r4 b 0 12  
i1 0 b 8  
.op  
.end
```

Direct Newton iteration for .op point succeeded.

Operating Bias Point Solution:

V(b)	24	voltage
V(a)	10	voltage
I(C1)	2.8e-11	device_current
I(I1)	8	device_current
I(R4)	2	device_current
I(R3)	2	device_current
I(R2)	2	device_current
I(R1)	2	device_current
I(V1)	2.8e-11	device_current

Date: Sun Mar 7 22:00:58 2021
Total elapsed time: 0.023 seconds.

```
tnom = 27  
temp = 27  
method = trap  
totiter = 3  
traniter = 0  
tranpoints = 0  
accept = 0  
rejected = 0  
matrix size = 3  
fillins = 0  
solver = Normal  
Matrix Compiler1: 3 opcodes  
Matrix Compiler2: 15 opcodes
```

Log du circuit simplifier

```
--- Expanded Deck Component Count ---
C's 1
I's 1
R's 1
V's 1
tot: 4

--- Expanded Netlist ---
*
v1 a 0 10
c1 b a 2
r1 b 0 3
i1 0 b 8
.op
.end

Direct Newton iteration for .op point succeeded.
Operating Bias Point Solution:
V(a)          10    voltage
V(b)          24    voltage
I(C1)         2.8e-11 device_current
I(I1)          8    device_current
I(R1)          8    device_current
I(V1)         2.8e-11 device_current

Date: Sun Mar  7 22:13:09 2021
Total elapsed time: 0.010 seconds.

tnom = 27
temp = 27
method = trap
totiter = 3
traniter = 0
tranpoints = 0
accept = 0
rejected = 0
matrix size = 3
fillins = 0
solver = Normal
Matrix Compiler1:      3 opcodes
Matrix Compiler2:     15 opcodes
```