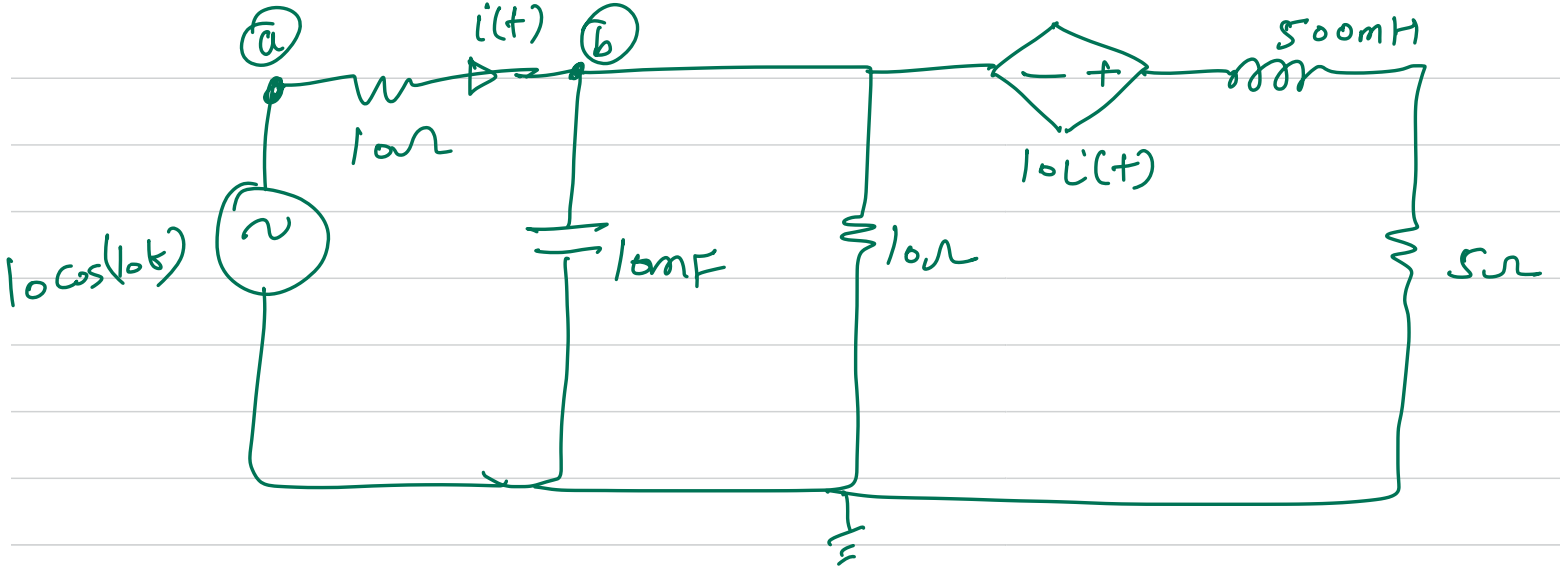
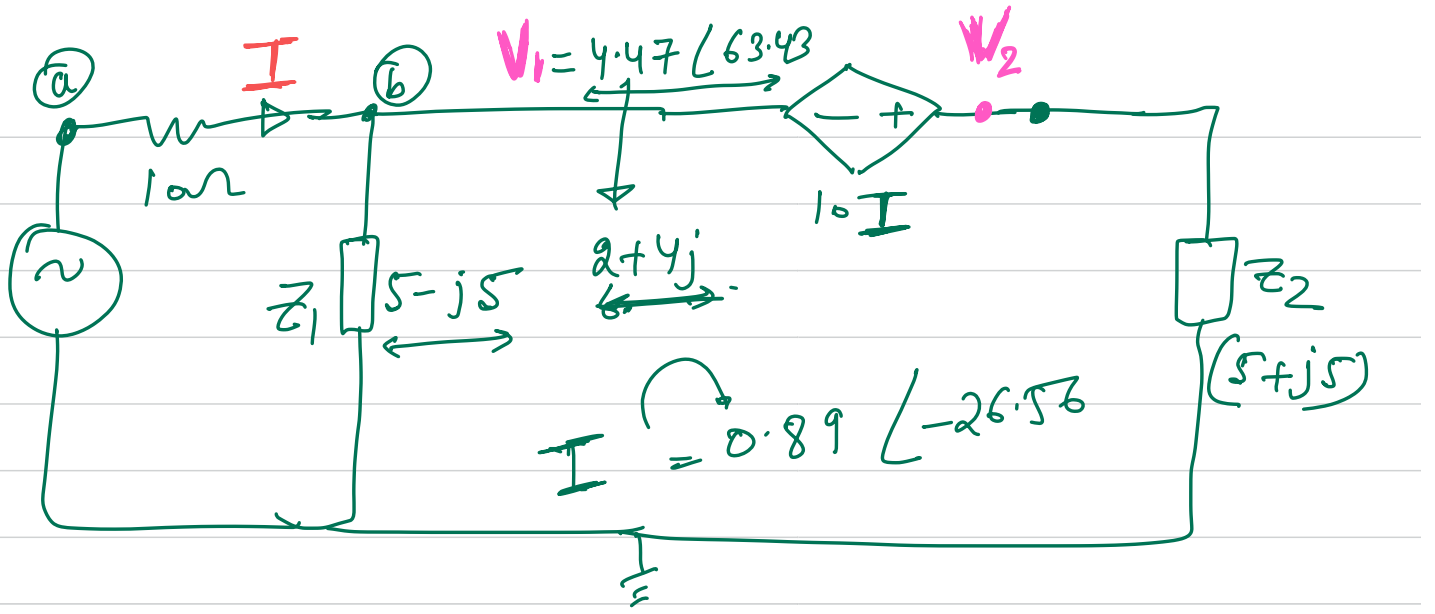

a
i(t)
b
500mH
1Ω
10i(t)
10cos(10t)
10mF
10Ω
5Ω



Expande

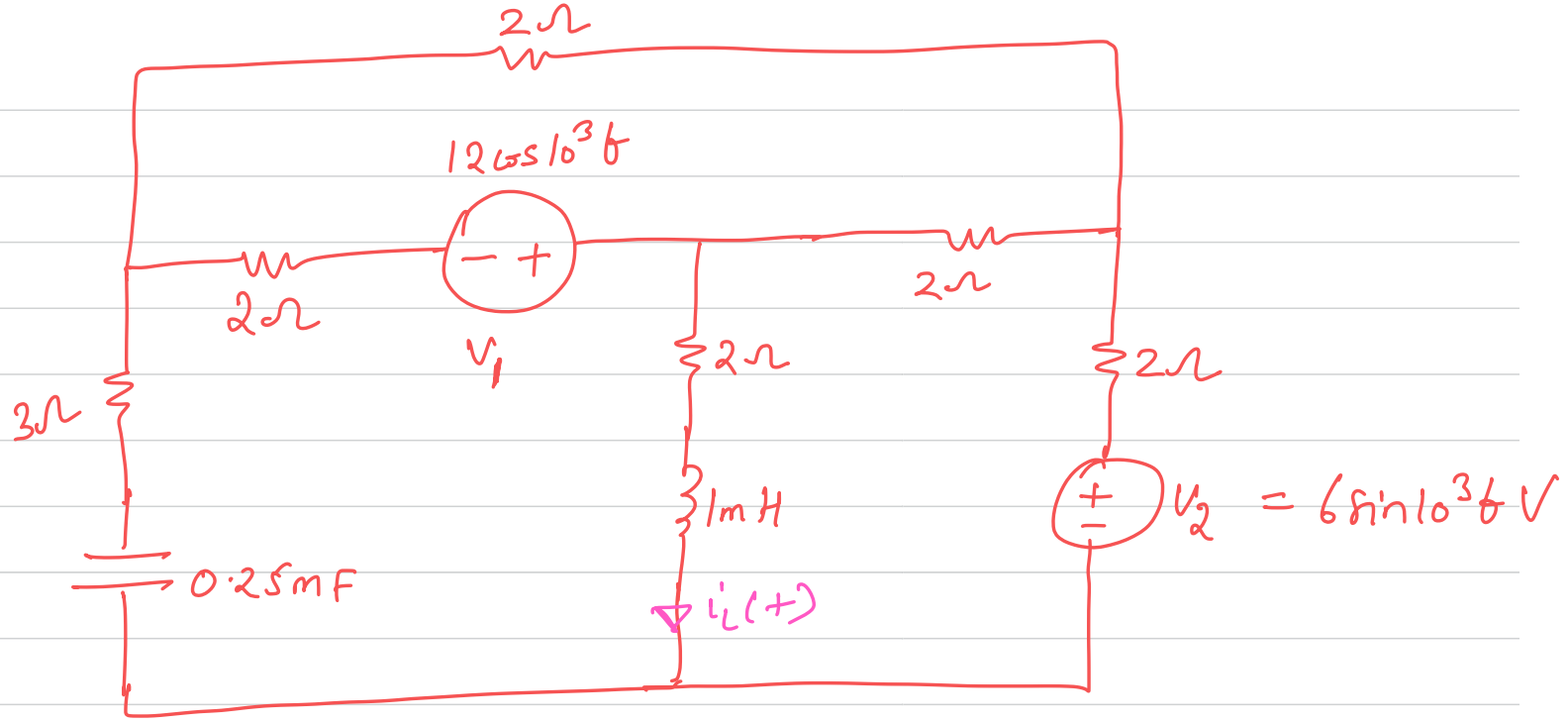
$$\rightarrow V_1\left(\frac{1}{10} + \frac{1}{5 - j5}\right) + \frac{V_2}{(5 + j5)} - \frac{10 \angle 0}{10} = 0$$

$$V_1 + 10I = V_2$$

$$I = \frac{10 \angle 0 - V_1}{10\Omega}$$

$10 + j0$

Q



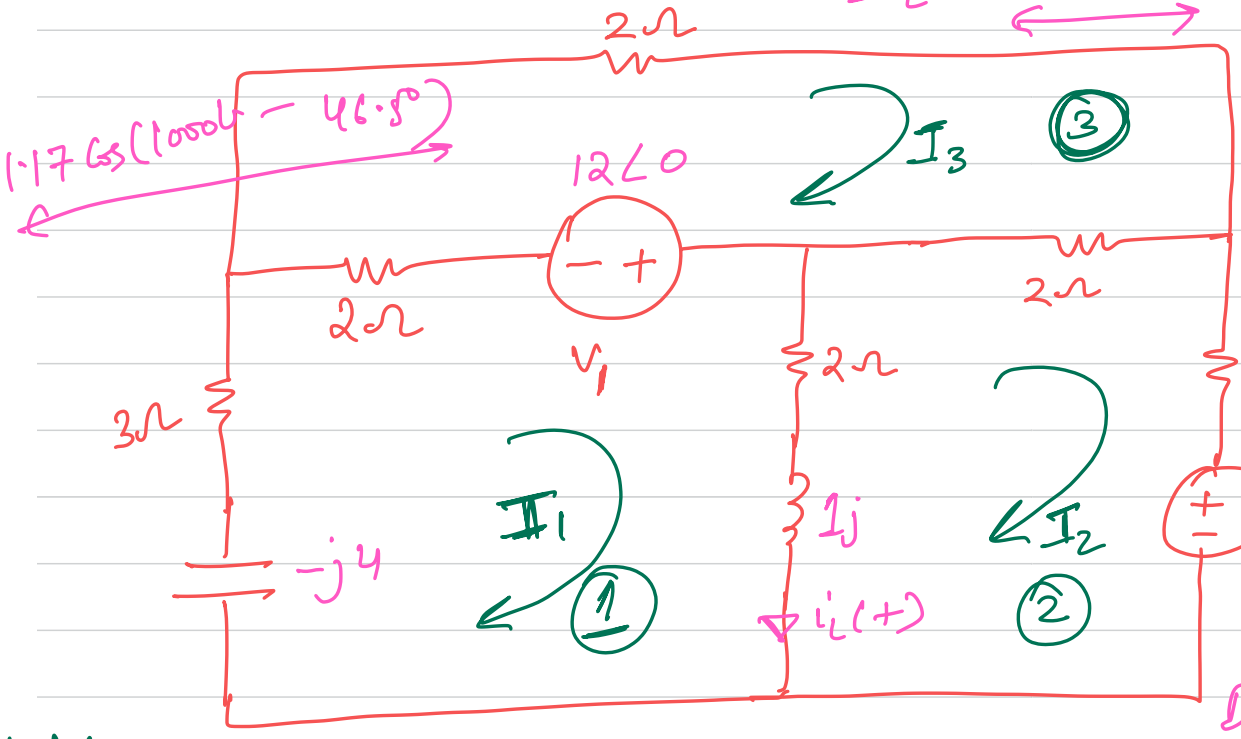
Loop $-2I_3 - 2(I_3 - I_2) - 12\angle 0 - 2(I_3 - I_1) = 0$

$\hookrightarrow A I_1 + B I_2 + C I_3 = 0$

$I_L = I_1 - I_2$

$$\begin{bmatrix} D & E & F \\ G & H & I \\ A & B & C \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \\ I_3 \end{bmatrix} =$$

$$\begin{bmatrix} -V_1 \\ -6j \\ 12\angle 0 \end{bmatrix}$$



$D I_1 + E I_2 + F I_3 = -V_1$

Lol 1

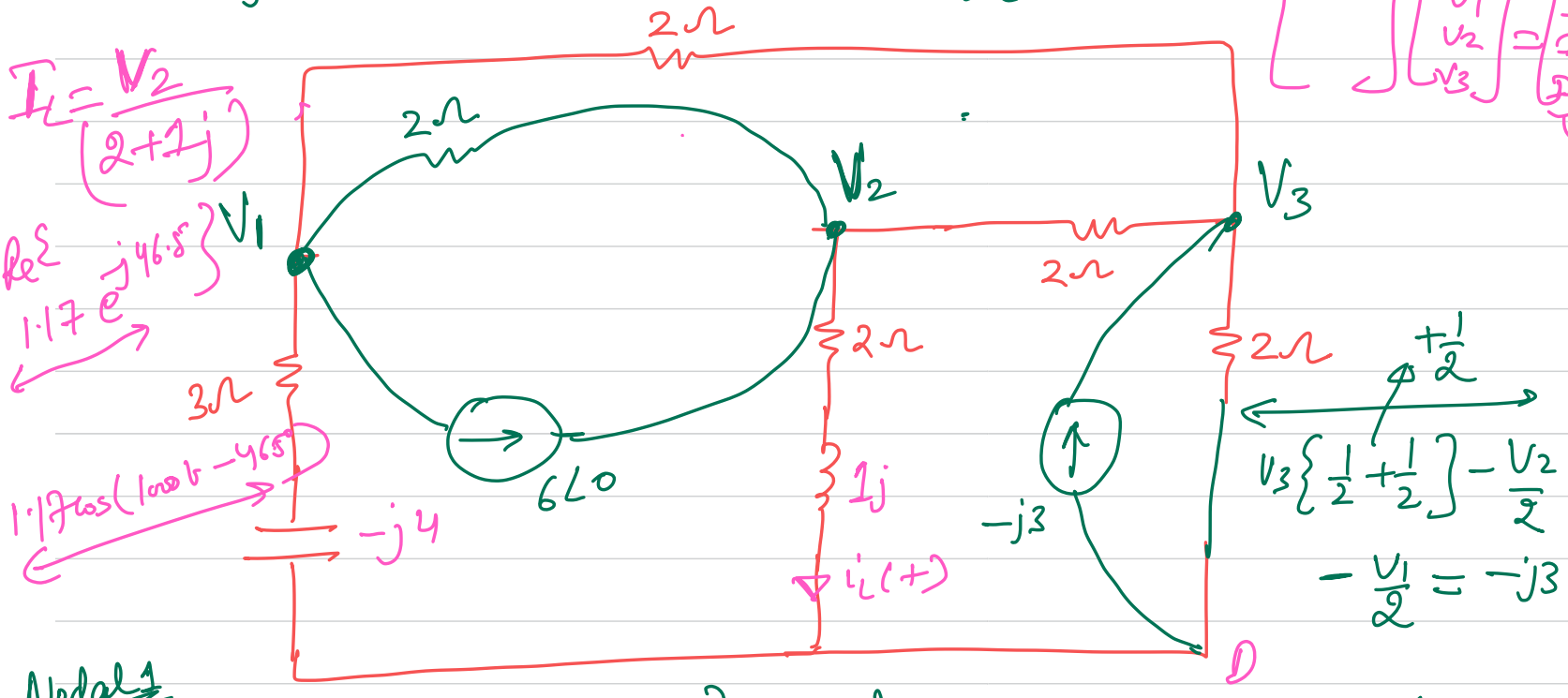
$$-I_1(3-j4) - 2(I_1 - I_3) + V_1 - (I_1 - I_2)(2+j1) = 0$$

Lol 2

$$-2(I_2 - I_3) - 2I_2 + 6j - (I_2 - I_1)(2+j1) = 0$$

$$V_2\left\{\frac{1}{2+j1}+\frac{1}{2}+\frac{1}{2}\right\}-\frac{V_1}{2}-\frac{V_3}{2}=6\angle 0$$

$$\begin{bmatrix}\quad\end{bmatrix}\begin{bmatrix}V_1\\V_2\\V_3\end{bmatrix}=\begin{bmatrix}I_1\\I_2\\I_3\end{bmatrix}$$



$I_L=\frac{V_2}{(2+1j)}$

$\mathrm{Re}\{1.17e^{j(\omega t-46.5)}\}$

$1.17\cos(1000t-46.5)$

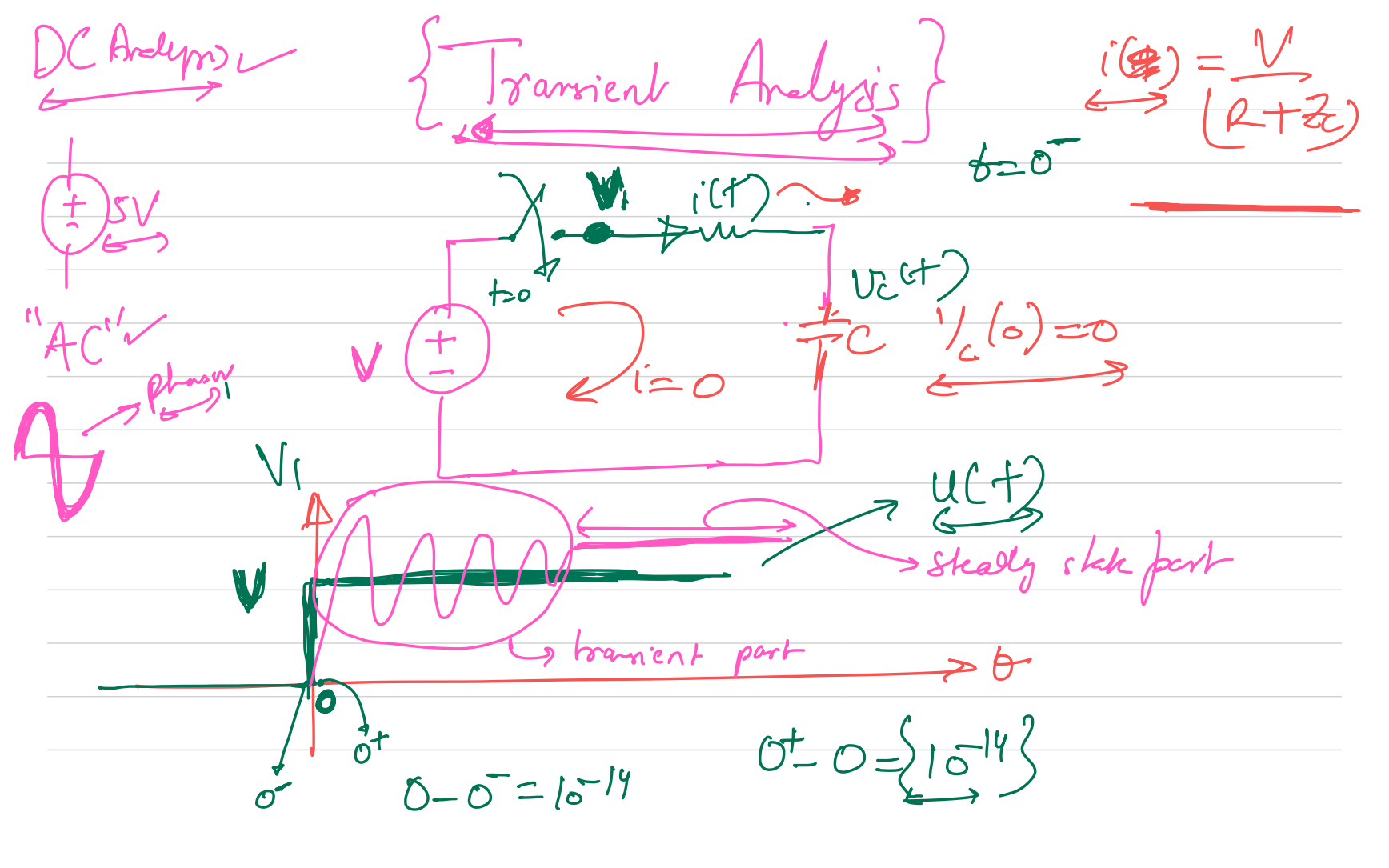
$+\frac{1}{2}$

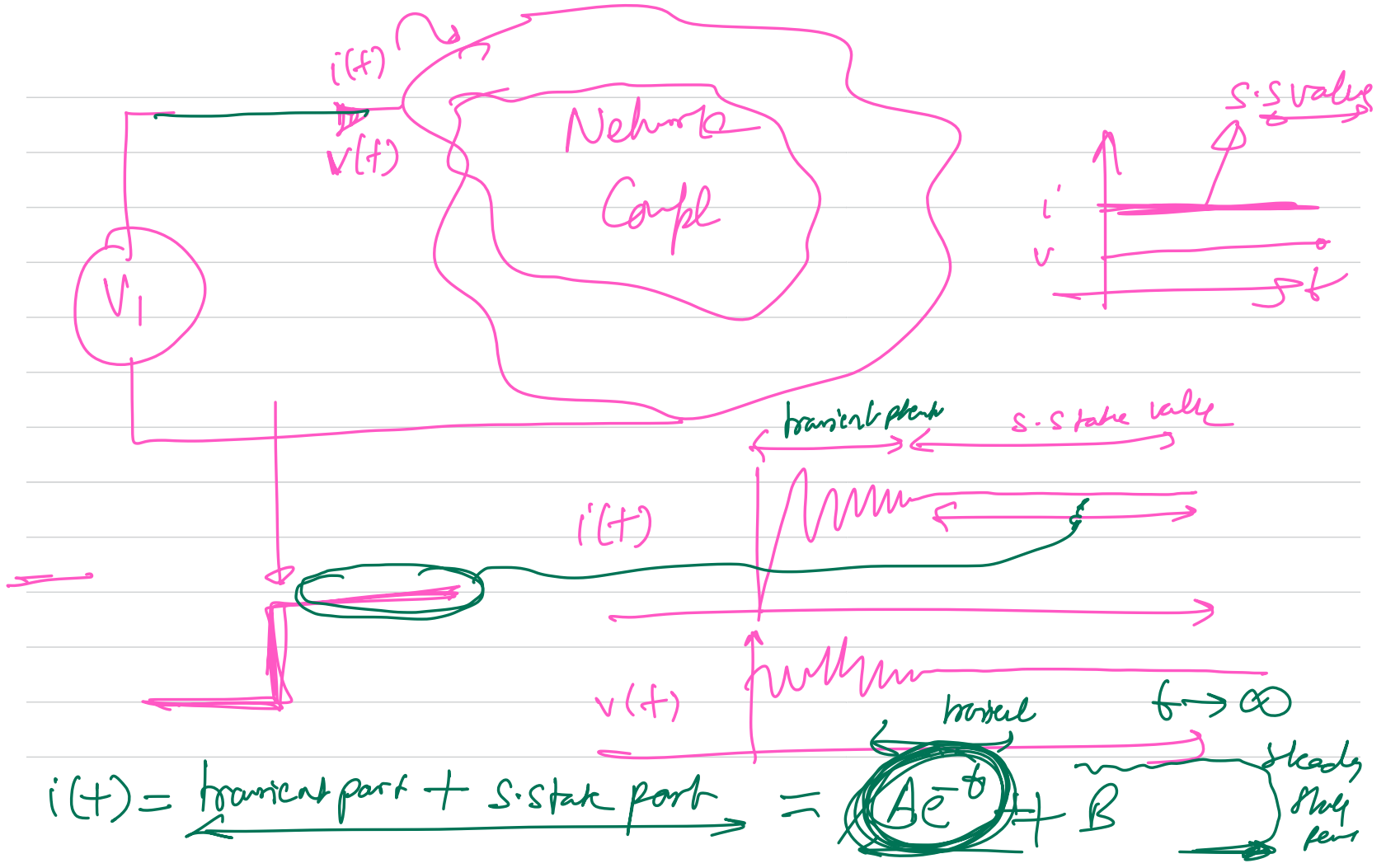
$V_3\left\{\frac{1}{2}+\frac{1}{2}\right\}-\frac{V_2}{2}$

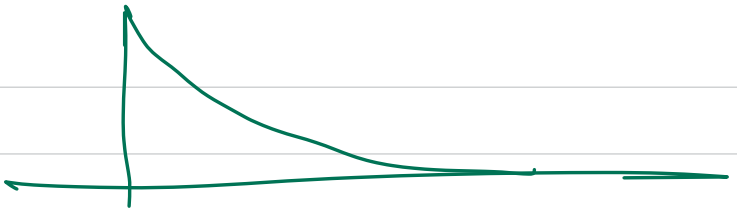
$-\frac{V_1}{2}=-j3.$

Nodal 1

$$V_1\left\{\frac{1}{3-j4}+\frac{1}{2}+\frac{1}{2}\right\}-\frac{V_2}{2}-\frac{V_3}{2}=-6\angle 0$$

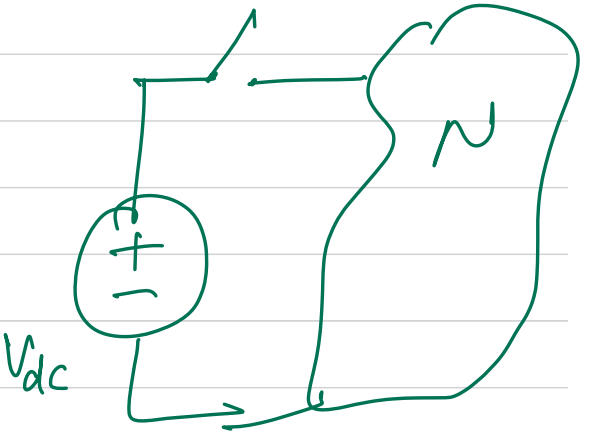

DC Analysis
Transient Analysis
$i(\phi) = \frac{V}{(R+Z_C)}$
5V
"AC"
Phasor
$t=0^-$
V_1
$i(t)$
$t>0$
$V_C(t)$
V
C
$V_C(0)=0$
$i=0$
V_1
V
$u(t)$
steady state part
transient part
t
0
0^+
0^-
$0-0^- = 10^{-14}$
$0^+ - 0 = \{10^{-14}\}$

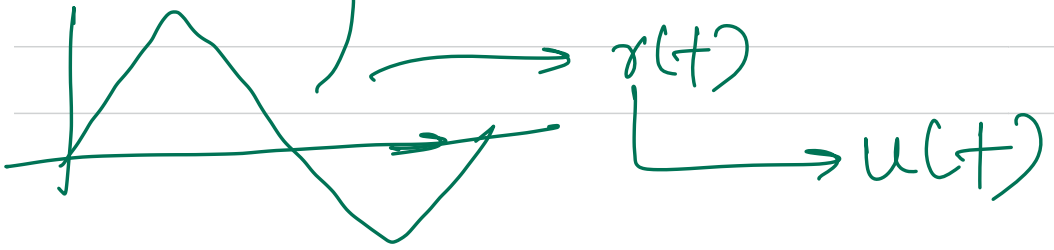

i(t)
v(t)
Network
Complex
V1
S.S value
i
v
t
transient phase
S.S state value
i(t)
v(t)
t → ∞
transient
steady state part
i(t) = transient part + S.state part = Ae^-t + B

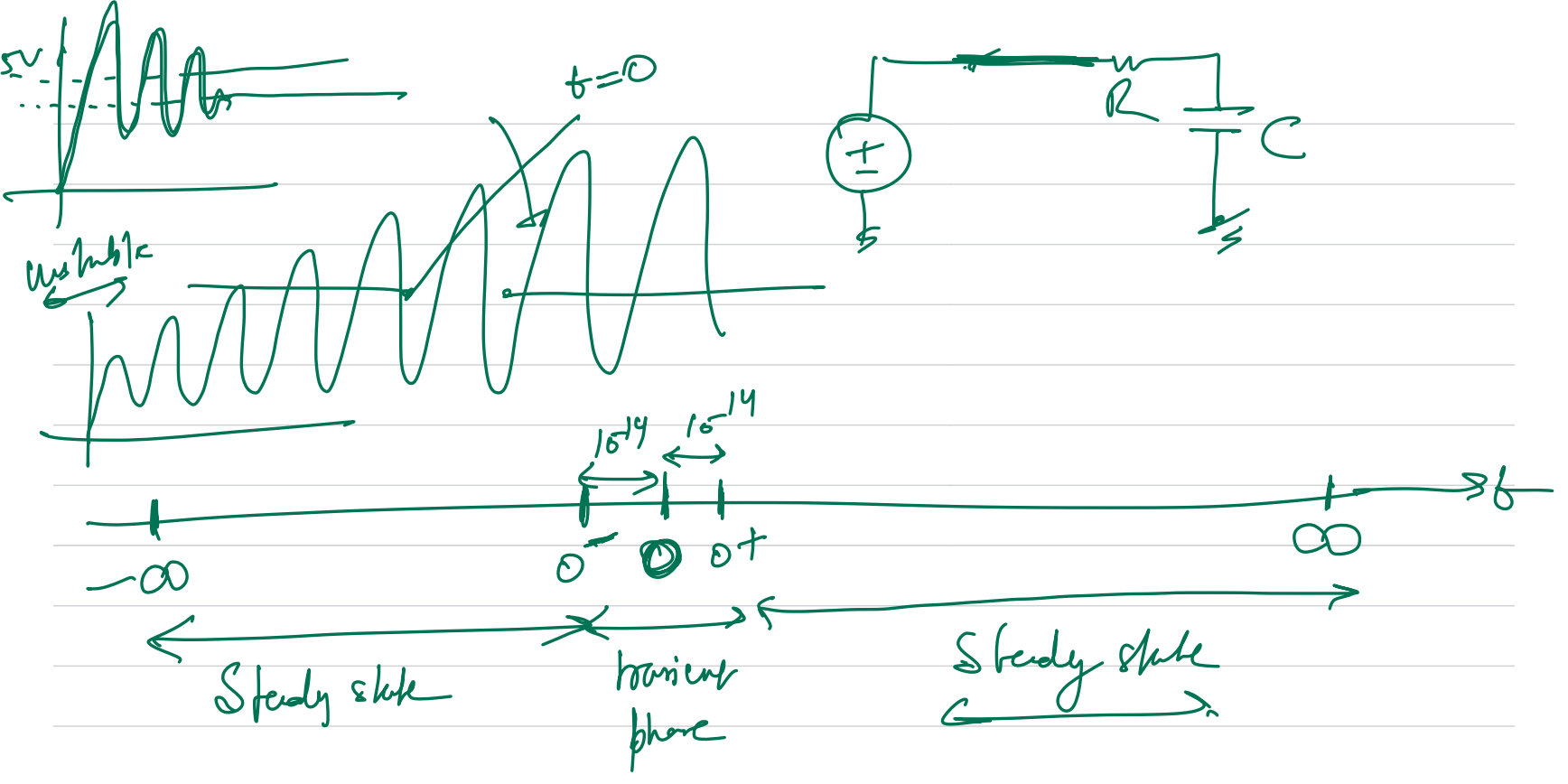



i(t), v(t)
N

≡


N
V_{dc}


r(t)
u(t)


5V
t=0
R
C
10^{-14}
10^{-14}
$-\infty$
0^-
0^+
∞
t
Steady state
transient phase
Steady state