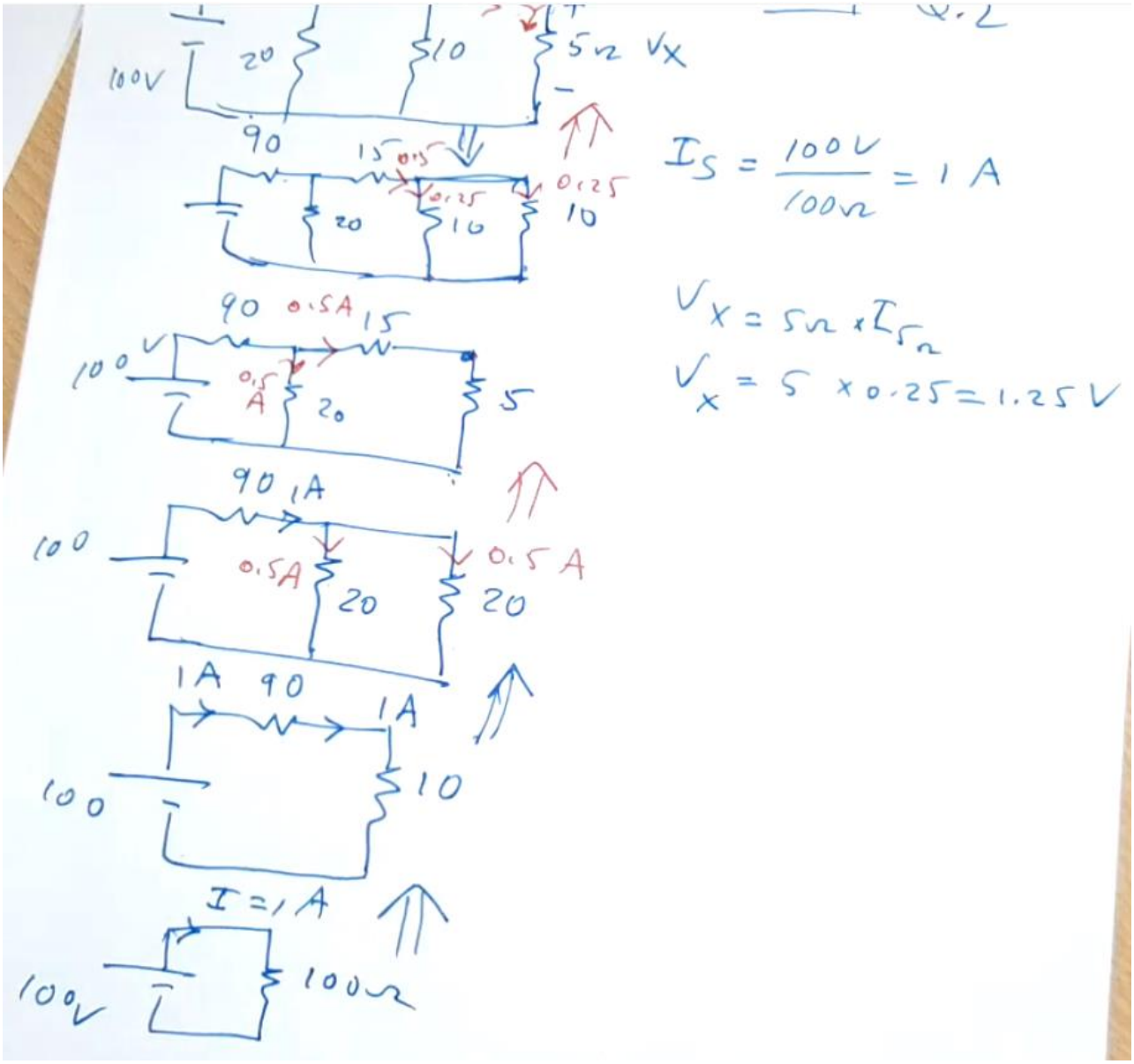
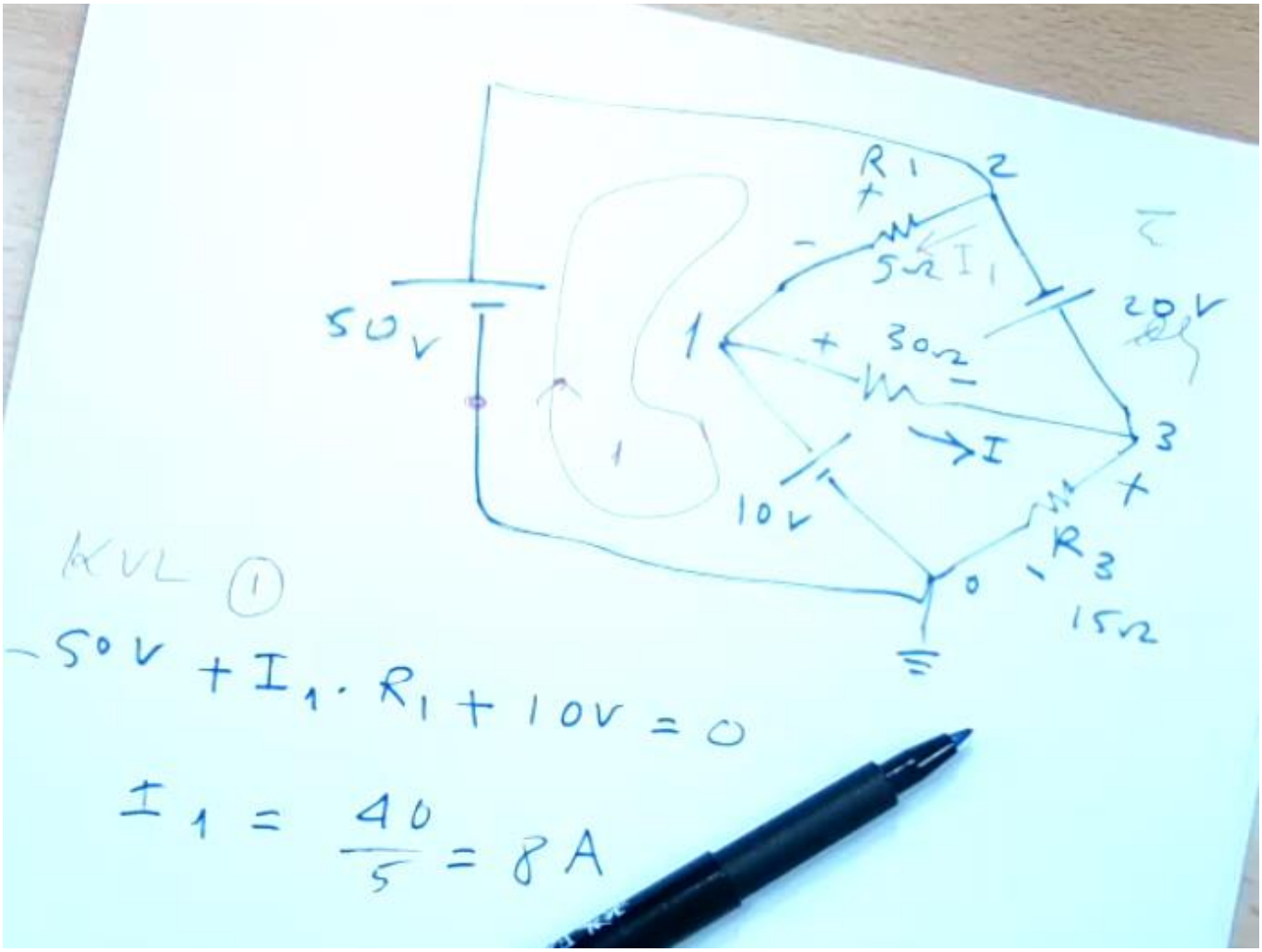
Attribution Nidhal Abdulaziz

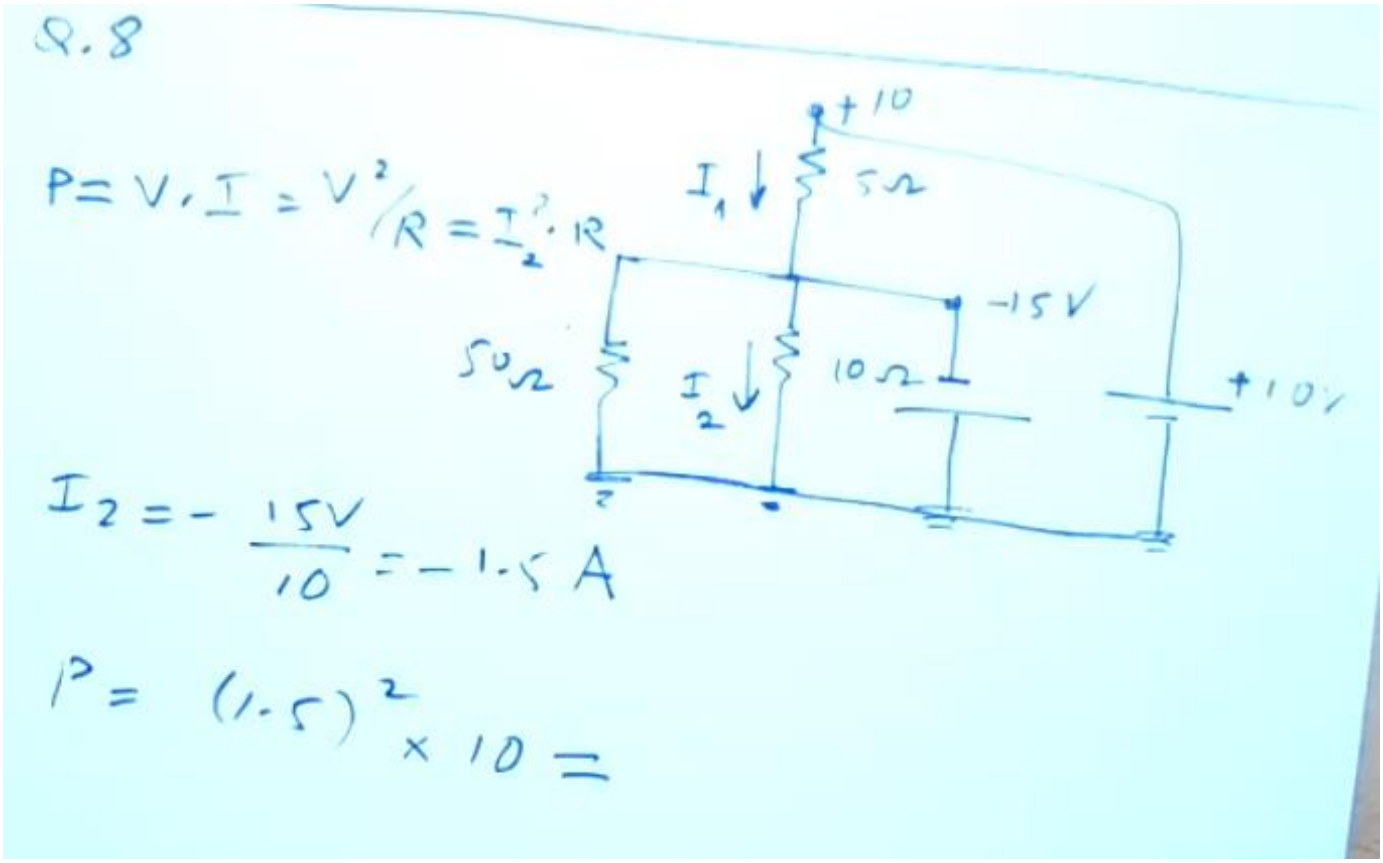
Tutorial 4 Question 2



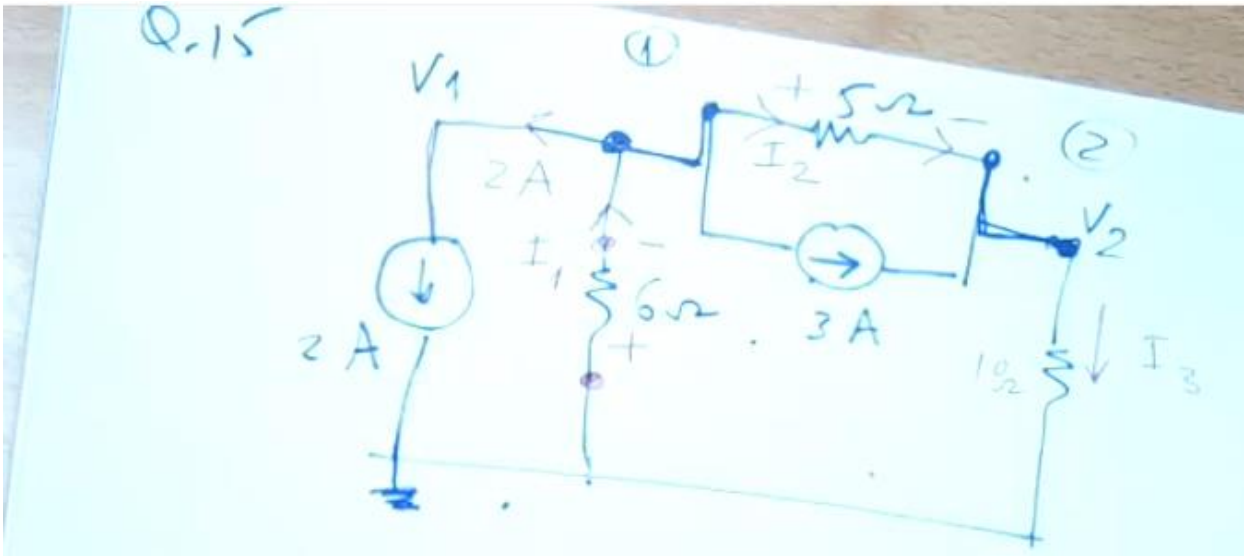
Question 5


R1
2
5Ω
I1
50V
1
30Ω
20V
I
3
10V
R3
15Ω
0
KVL ①
-50V + I1 · R1 + 10V = 0
I1 = 40/5 = 8A

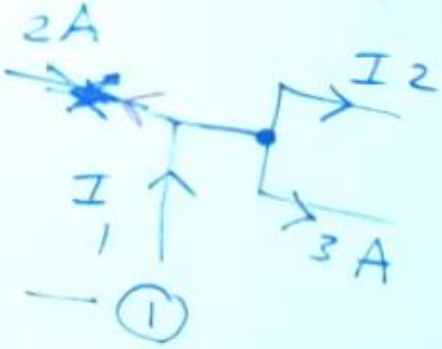
Question 8



Question 15



KCL ①



$$I_1 = 2A + 3A + I_2 \quad \text{—— ①}$$

KCL ②

$$3A + I_2 = I_3 \quad \text{—— ②}$$

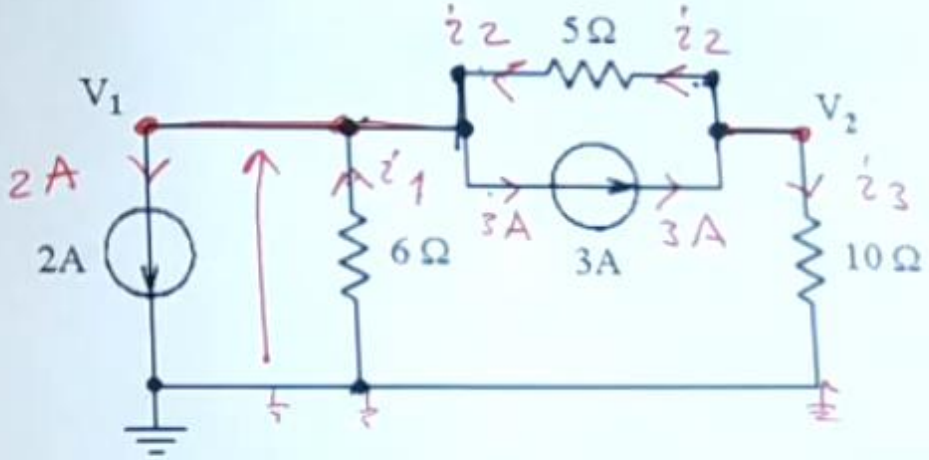
$$I_1 = \frac{0 - V_1}{6}$$

$$I_2 = \frac{V_1 - V_2}{5}$$

$$I_3 = \frac{V_2 - 0}{10}$$

OR

Tut 4 Q.15



KCL node ①

$i_1 + i_2 = 2A + 3A$ —— ①

$i_1 = \frac{0 - V_1}{6\Omega}$

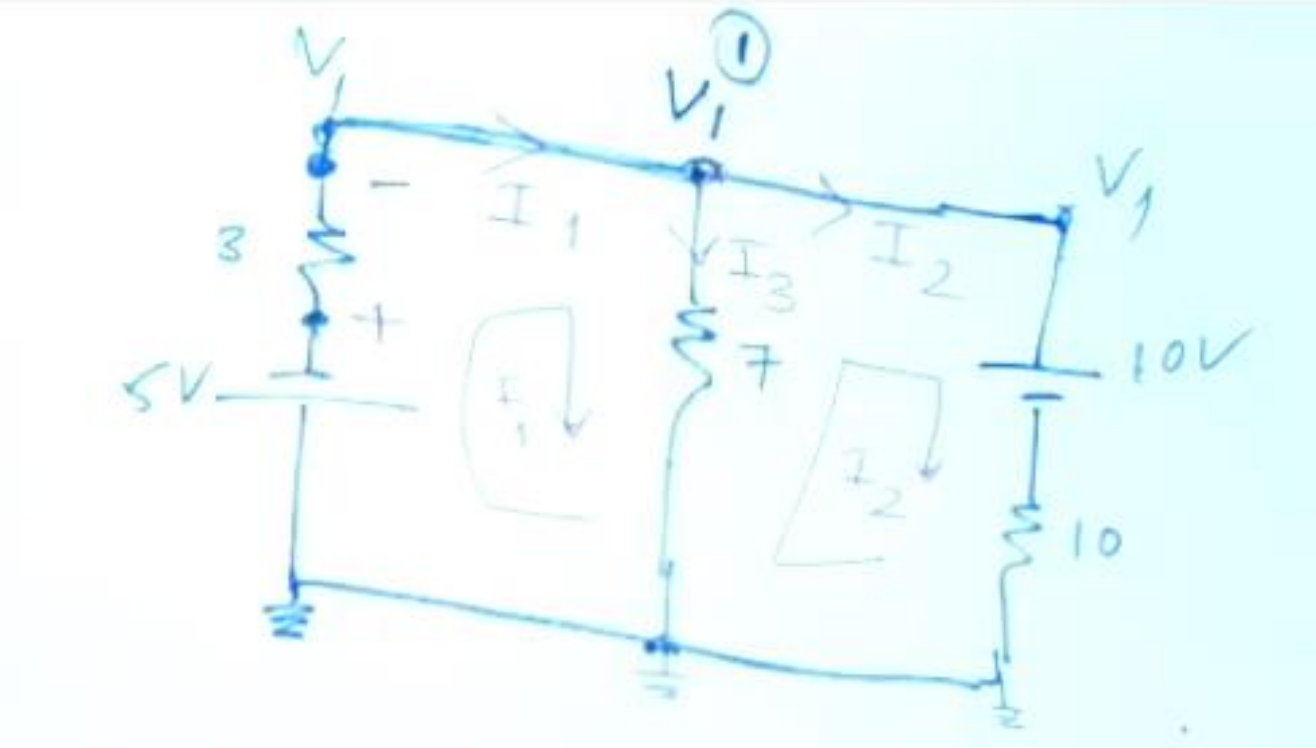
$i_2 = \frac{V_2 - V_1}{5\Omega}$

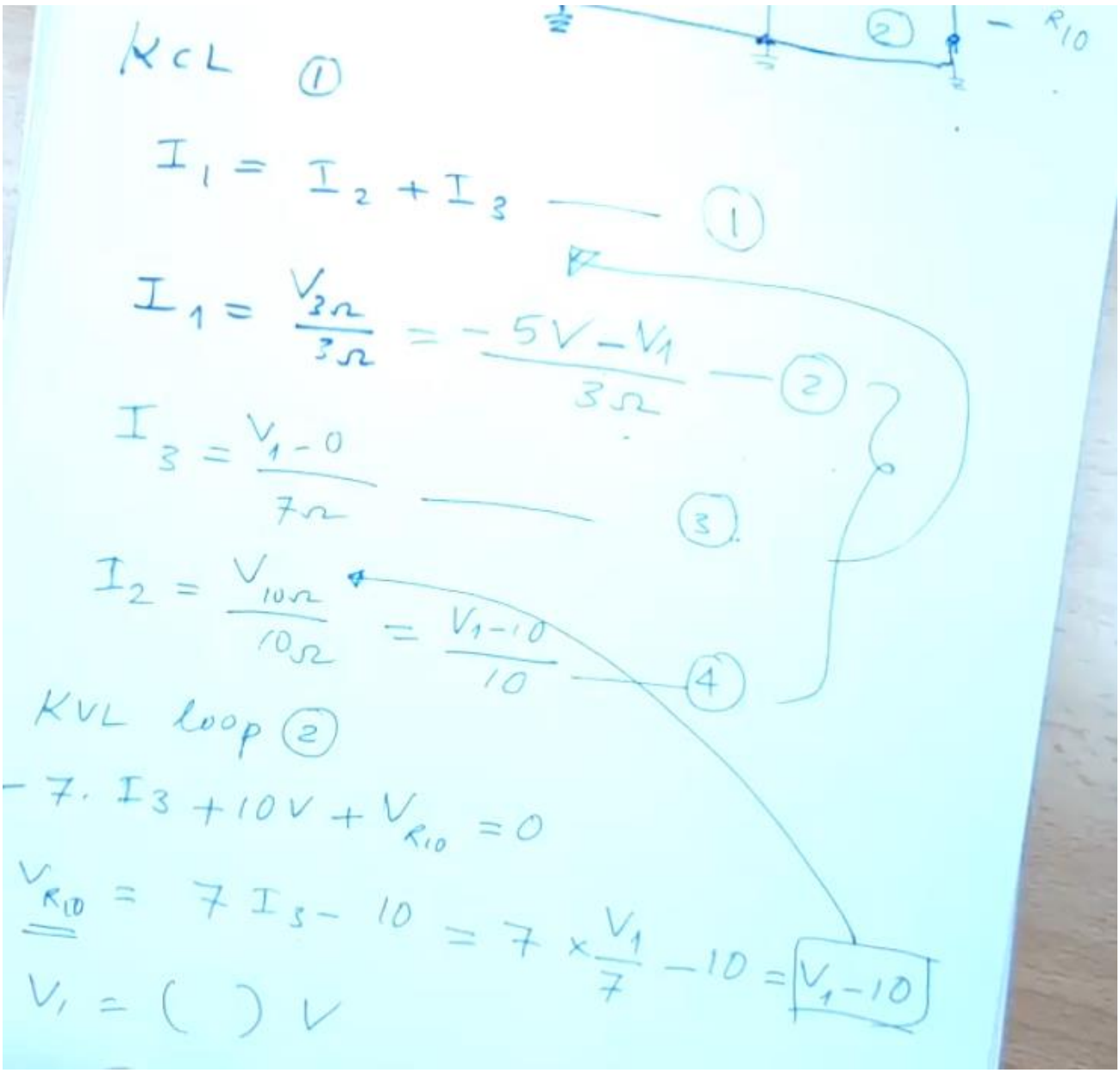
$i_3 = \frac{V_2 - 0}{10}$

KCL node ②

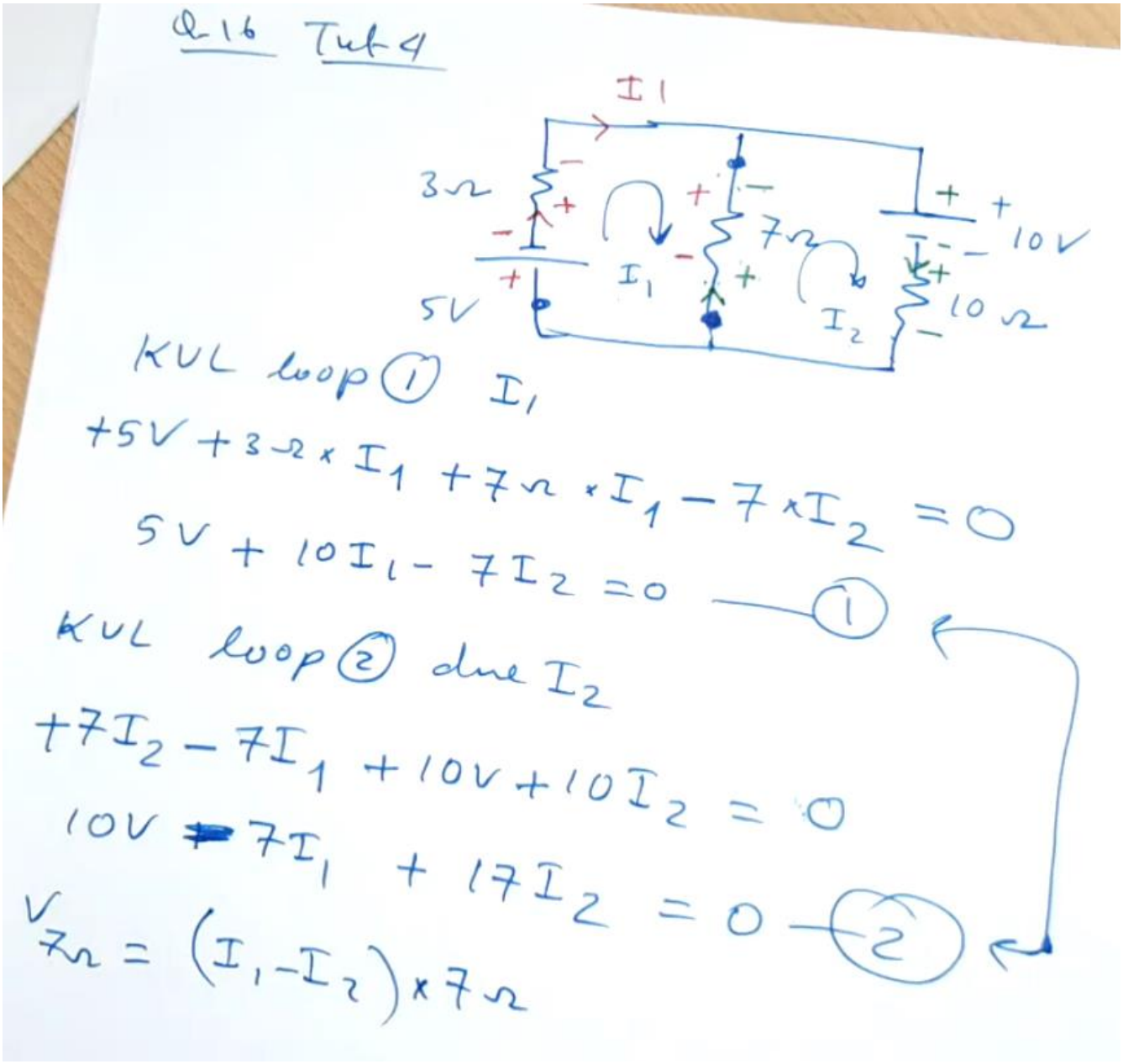
$3A = i_2 + i_3$ —— ②

Question 16

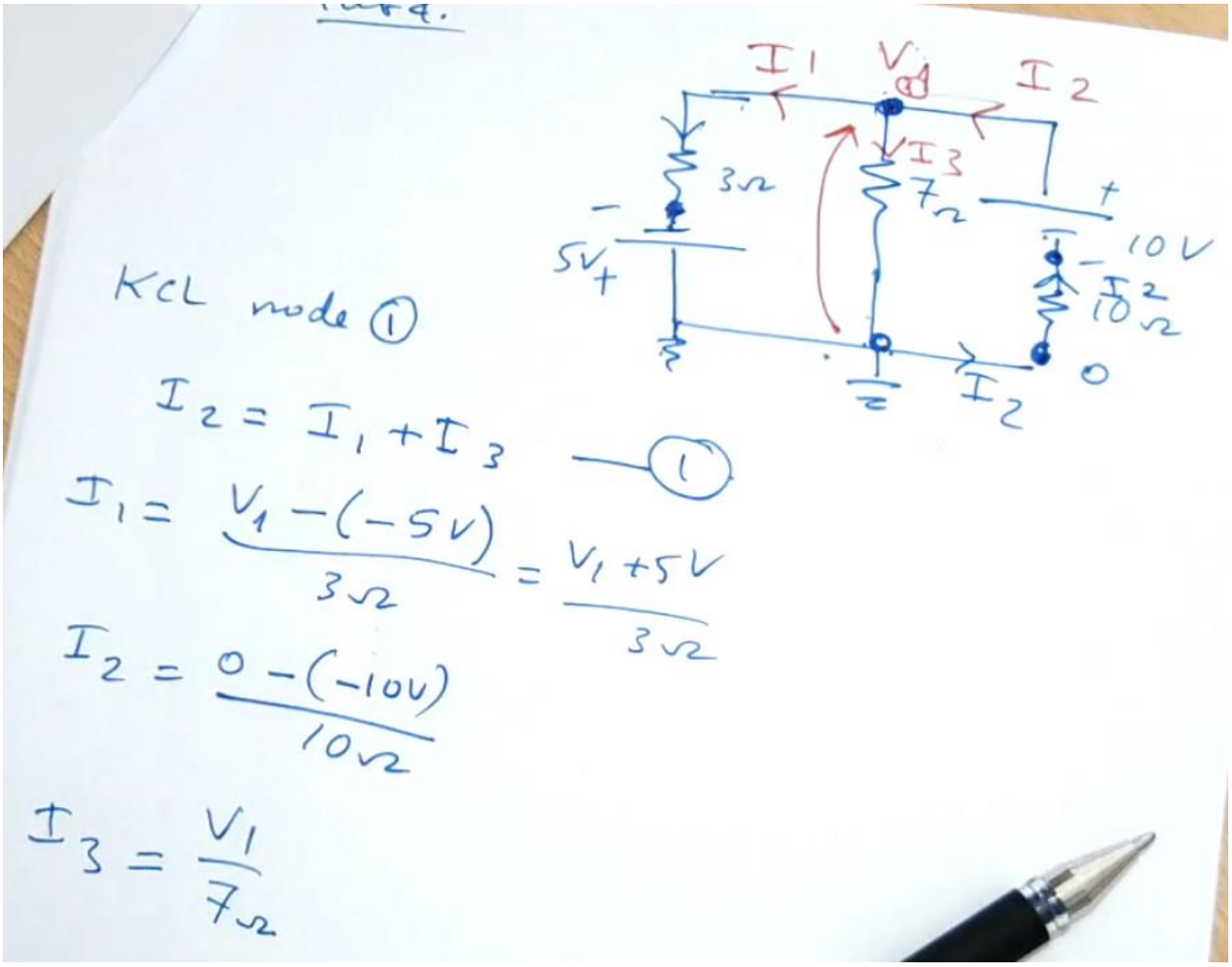



KCL ①
$I_1 = I_2 + I_3$ —— ①
$I_1 = \frac{V_{3\Omega}}{3\Omega} = \frac{-5V - V_1}{3\Omega}$ —— ②
$I_3 = \frac{V_1 - 0}{7\Omega}$ —— ③
$I_2 = \frac{V_{10\Omega}}{10\Omega} = \frac{V_1 - 10}{10}$ —— ④
KVL loop ②
$-7 \cdot I_3 + 10V + V_{R10} = 0$
$V_{R10} = 7 I_3 - 10 = 7 \times \frac{V_1}{7} - 10 = V_1 - 10$
$V_1 = (\quad) V$
R_{10}

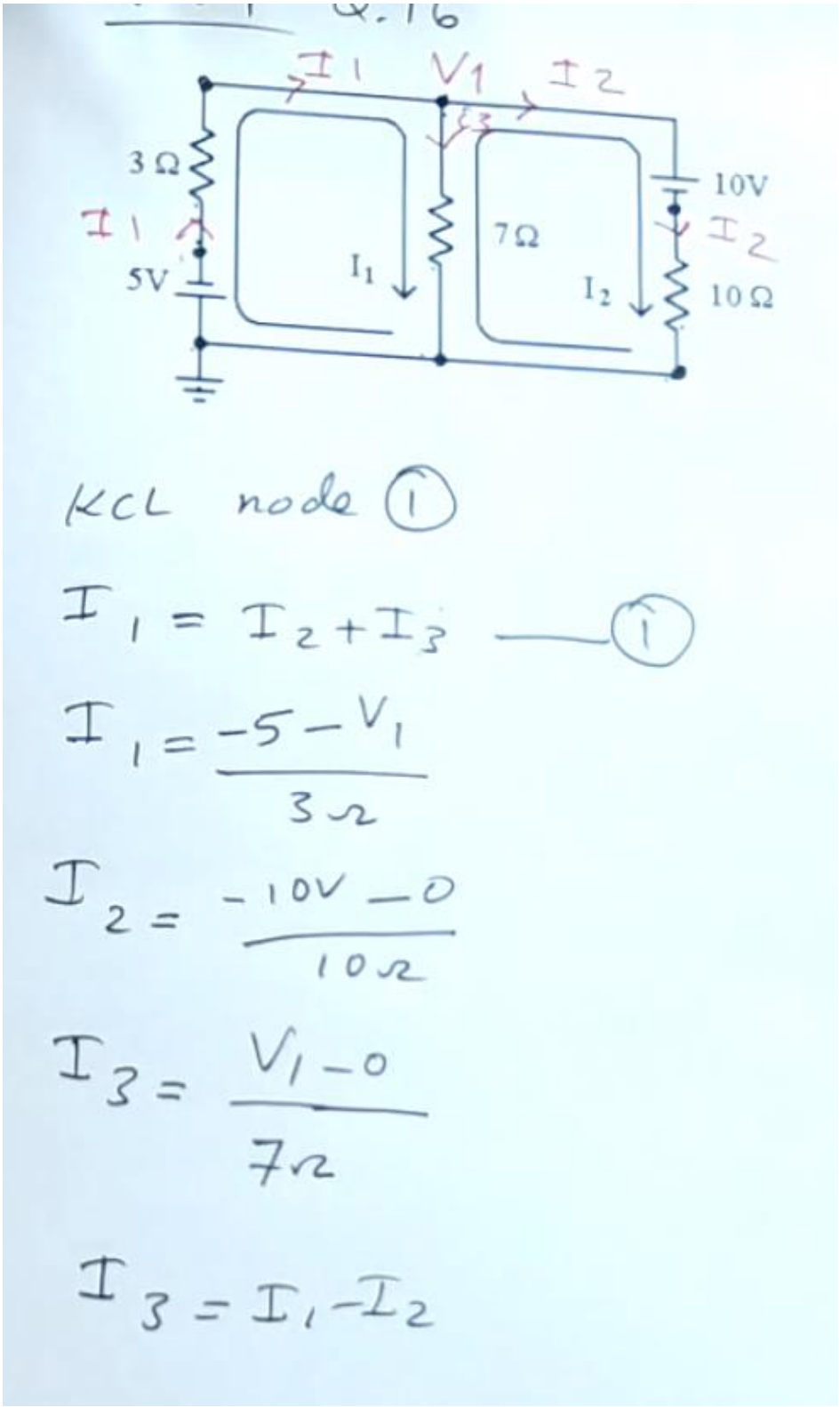
OR


Q16 Tut 4
I1
3Ω
7Ω
10V
5V
I1
I2
10Ω
KVL loop (1) I1
+5V + 3Ω × I1 + 7Ω × I1 − 7 × I2 = 0
5V + 10I1 − 7I2 = 0 — (1)
KVL loop (2) due I2
+7I2 − 7I1 + 10V + 10I2 = 0
10V + 7I1 + 17I2 = 0 — (2)
V7Ω = (I1 − I2) × 7Ω

OR


I1
V1
I2
I3
3Ω
7Ω
5V
10V
10Ω
0
KCL node ①
$I_2 = I_1 + I_3$ — ①
$I_1 = \frac{V_1 - (-5V)}{3\Omega} = \frac{V_1 + 5V}{3\Omega}$
$I_2 = \frac{0 - (-10V)}{10\Omega}$
$I_3 = \frac{V_1}{7\Omega}$

OR


Q.16
I1
V1
I2
I3
3Ω
I1
5V
I1
7Ω
I2
10V
I2
10Ω
KCL node (1)
$I_1 = I_2 + I_3$ ——— (1)
$I_1 = \frac{-5 - V_1}{3\Omega}$
$I_2 = \frac{-10V - 0}{10\Omega}$
$I_3 = \frac{V_1 - 0}{7\Omega}$
$I_3 = I_1 - I_2$