Attribution Nidhal Abdulaziz

Tutorial 5 Question 3

$V_{th} = 1.5 A \times 50\Omega$
$= 75V$
$I_N = \frac{75}{50} = 1.5 A$

$R_{th} = 50\Omega$
$R_N = 50\Omega$

Tutorial 5 Question 5

$$I_T = \frac{10V}{6.8} = 1.4 A$$

$$I_2 = 1.4 A \times \frac{1}{1+4.3}$$

$$I_2 = 0.3 A$$

$$I' = 0.3 A \times \frac{3}{3+10}$$

$$\boxed{I = 0.069 A \downarrow}$$

20V

6   2   T

s/c $\lessgtr$1 $\lessgtr$3 $\lessgtr$10   I

                        (-+)
                        20V

$I_T = \dfrac{20V}{11 \cdot 4}$

$I_T = 1.7\,A$ $\left(\dfrac{6\times1}{6+1}\right)\lessgtr0.8$ 2   I 10

$I = -1.7\,A$ $\lessgtr$3   (T)20V

$I = I' + I''$ I 10

                                                    2-8 $\lessgtr$ $\lessgtr$3   20V

$= 0.069 - 1.7$ I 10

$I = -1.6\,A$ 1.4 I_T
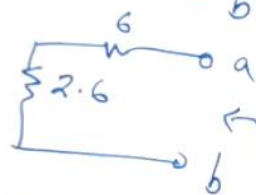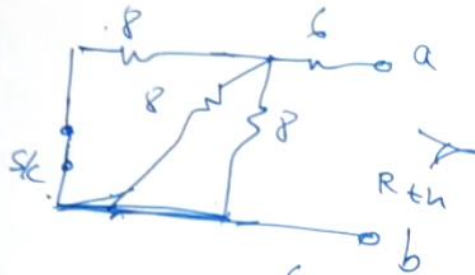
                                                    (I) 20V
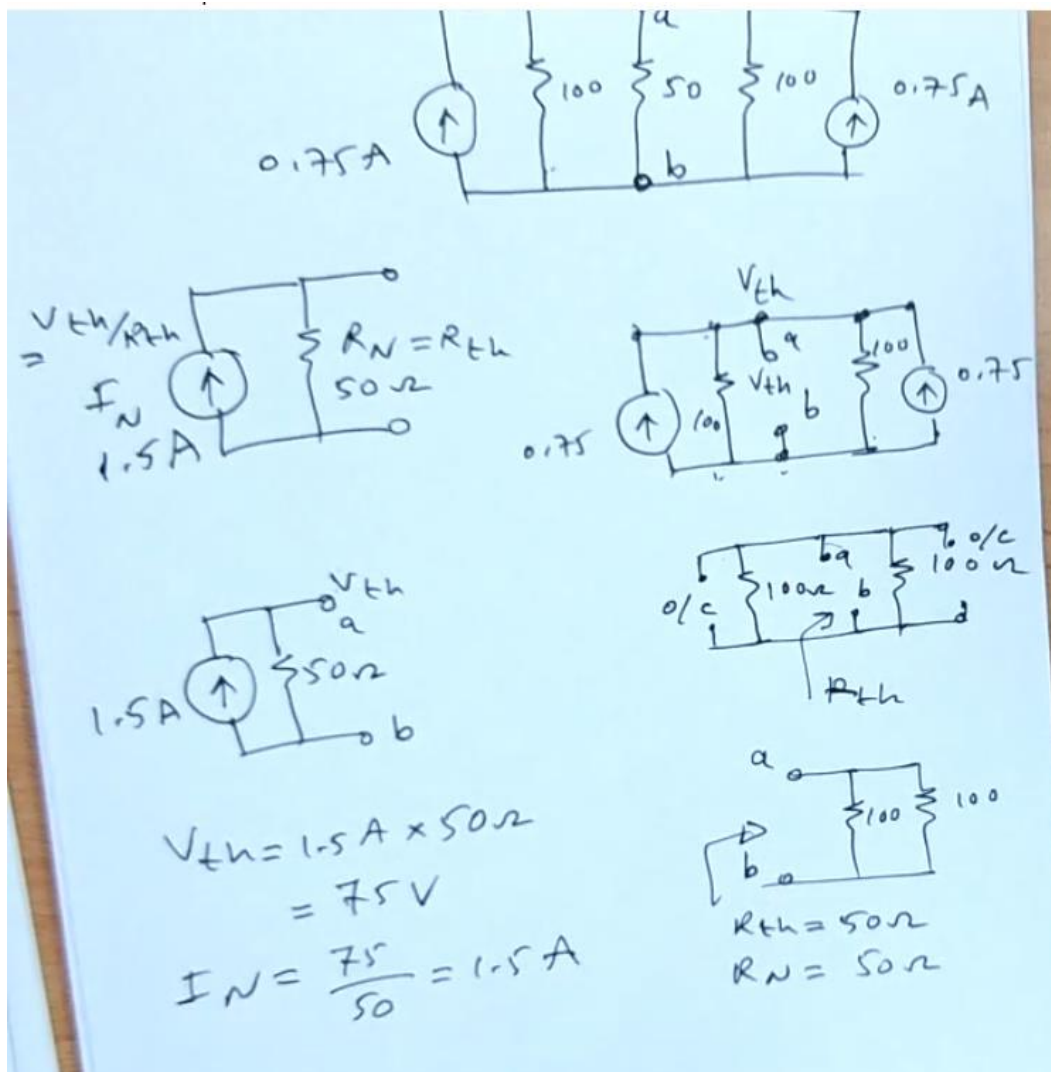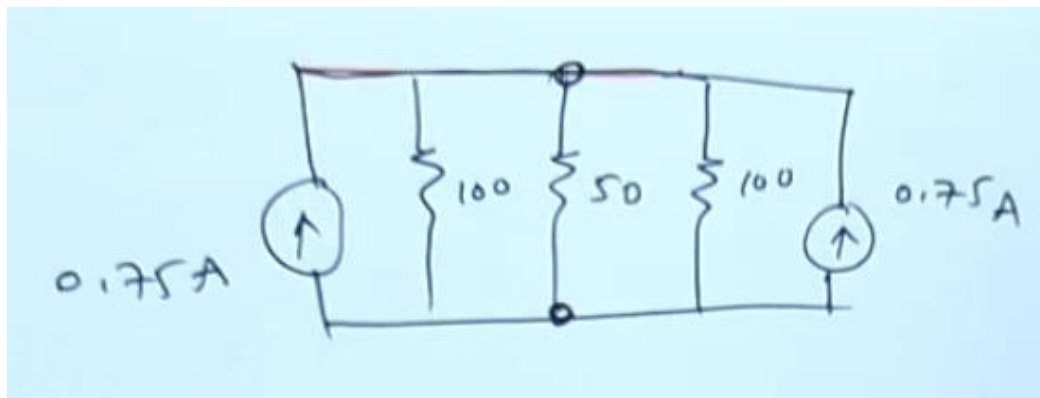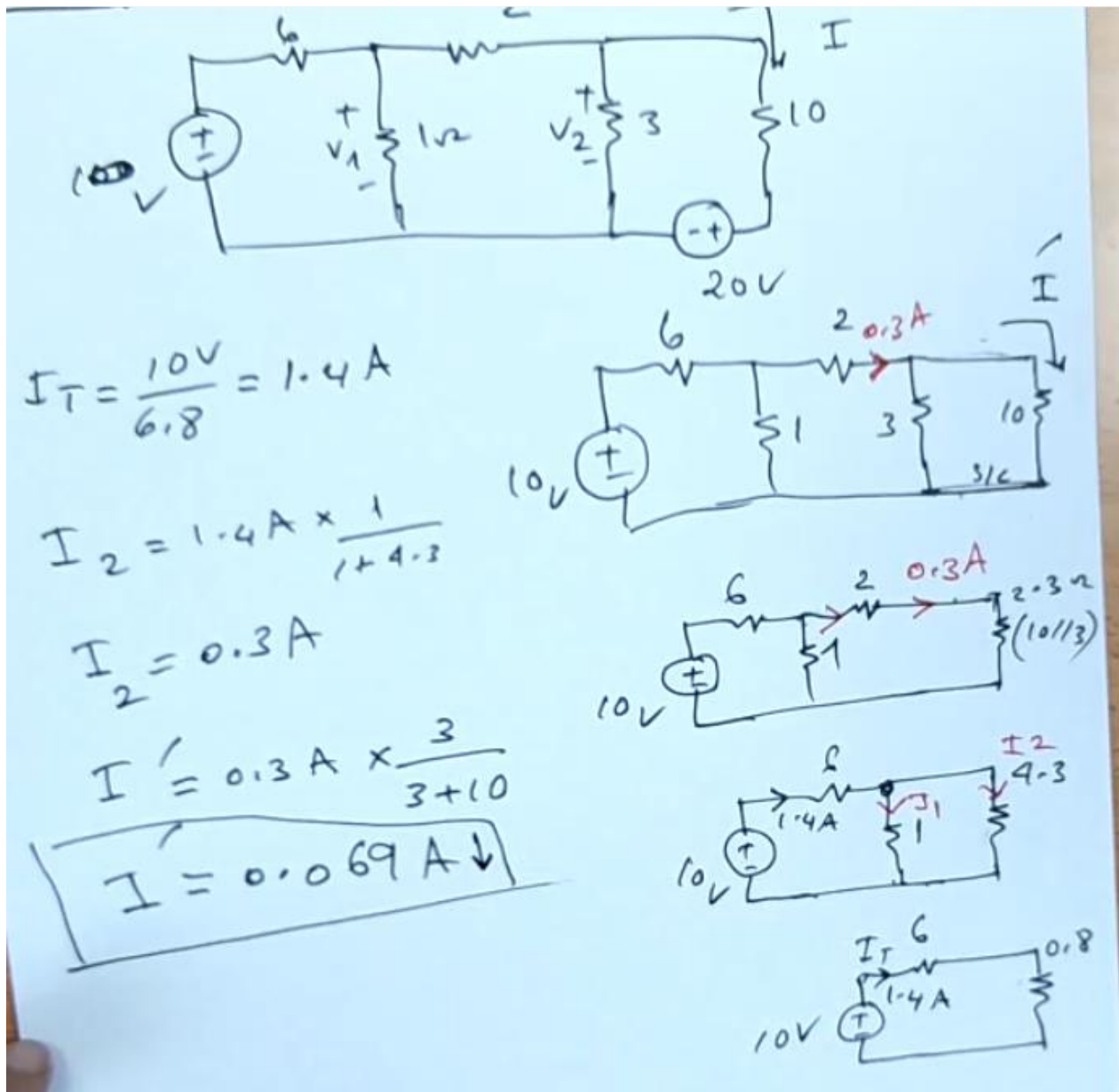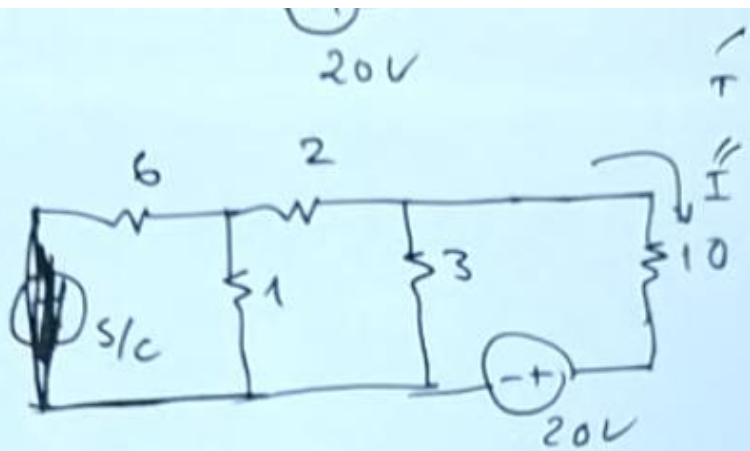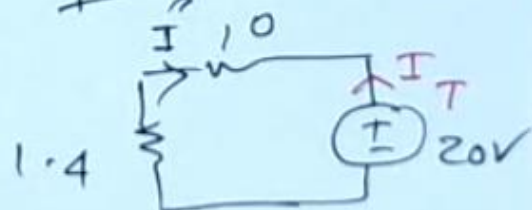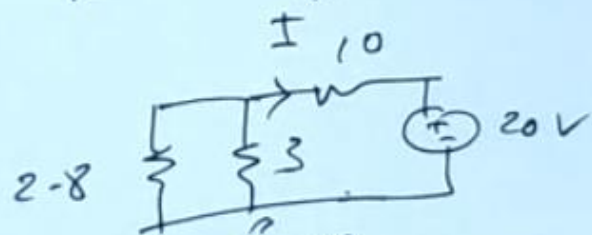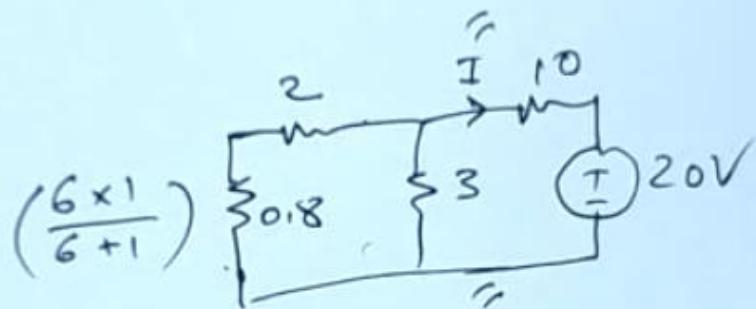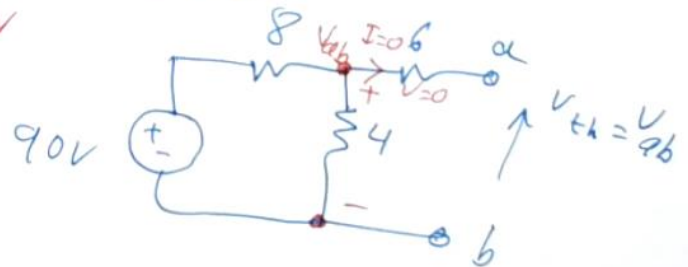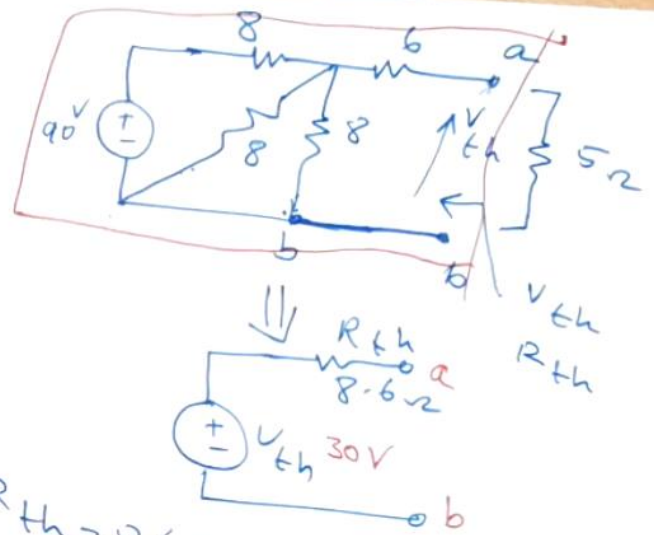
Tutorial 5 Question 8

Tut 5 Q.8

R_{th}

$U_{th} = V_{ab} = V_4 = 90V \times \dfrac{4}{8+4} = 30V$

$R_{th} = 8.6\Omega$

$V_{th} = V_{ab}$
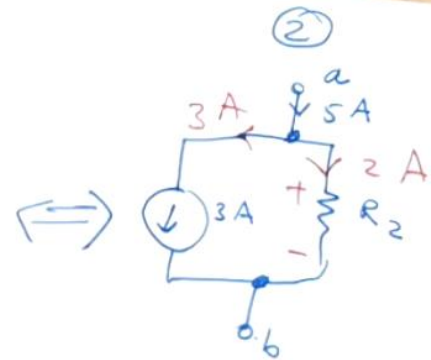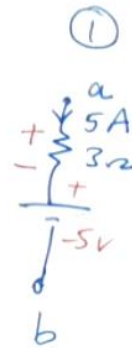
Tutorial 5 question 11

Q.11 Tut 5

Circuit ①

$V_{ab} = 5A \times 3\Omega + 5V$

$V_{ab} = 20V$
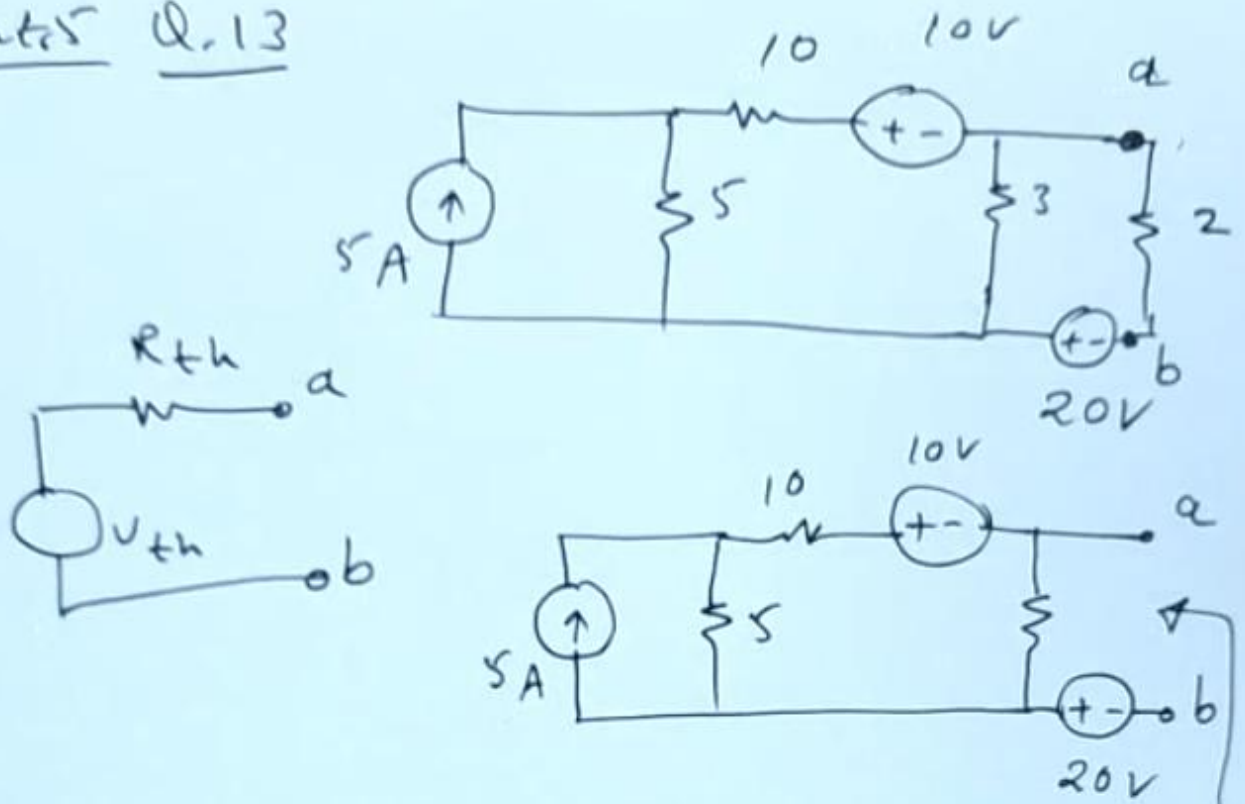
Circuit ② $V_{ab} = 20V = V_{R_2} = I_{R_2} \times R_2$

$2 \times R_2 = 20V$

$R_2 = 10\Omega$.
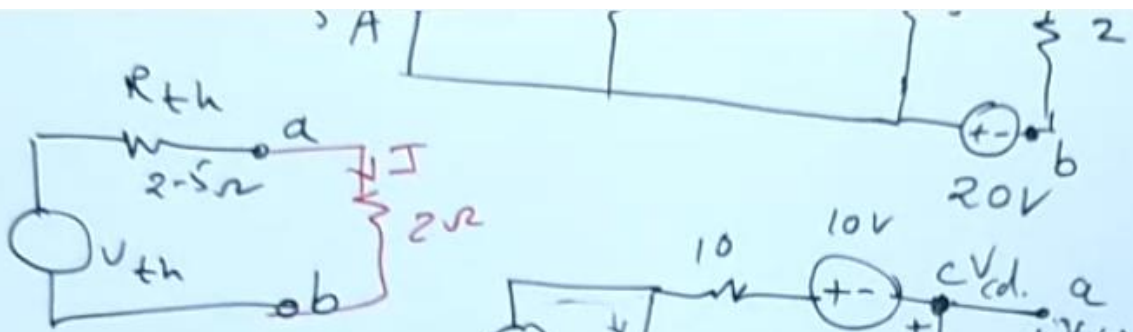
①

a

+
− ⌇ 5A
     ⌇ 3Ω
+

⌇ −5V

b

②

a

3 A   ⌇ 5A

⟵⟶   (↓) 3 A   + ⌇ 2 A
                    ⌇ R₂
                  −

b

Tutorial 5 question 13

Tut;5 Q.13

R_{th}

$$R_{th} = \frac{15 \times 3}{15 + 3}$$

$$R_{th} = 2.5 \, \Omega$$

$$-V_{cd} + V_{th} - 20V = 0$$

$$V_{th} = V_{cd} + 20V$$

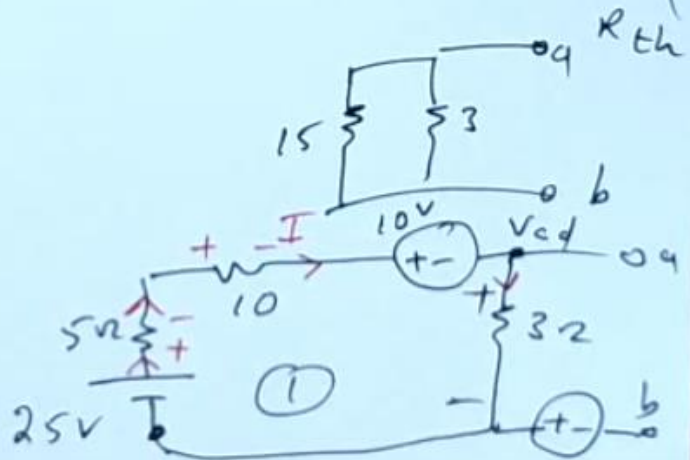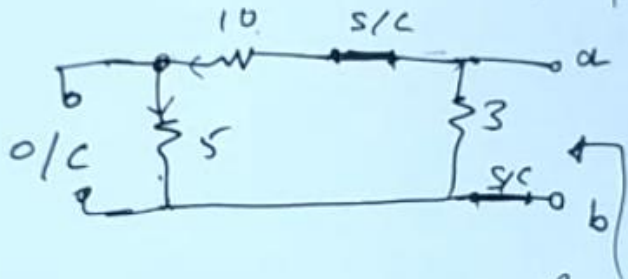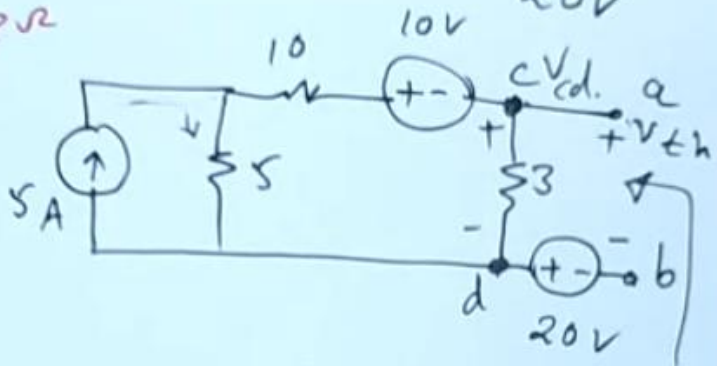KVL Loop ①

$$-25V + I \times 5 + I \times 10 + 10V + V_{cd} = 0$$

$$V_{cd} = I \cdot 3$$
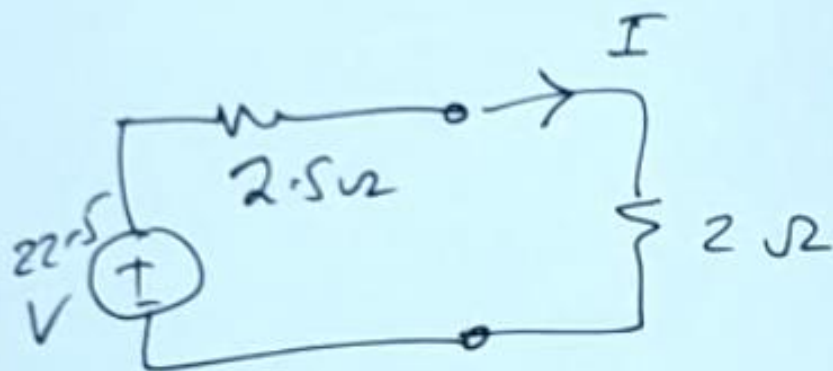
$$-15V + 18I = 0$$

$$I = \frac{15}{18} = 0.8A; \quad V_{cd} = 3 \times 0.8 = 2.5V$$

$$V_{th} = V_{cd} + 20 = 2.5 + 20 = 22.5V$$

$$I = \frac{22.5V}{4.5} = 5 \text{ Amps.}$$

Tutorial 5 question 14

VDR

$$V_4' = 10v \times \frac{4}{12+4}$$

$$V_4' = 2.5V$$

$$V_4'' = 8 \times \frac{4}{4+12}$$

$$= 2V$$

$$V_4 \ total = V_4' + V_4''$$

$$= 2.5 - 2$$

$$V_4' = 0.5V$$