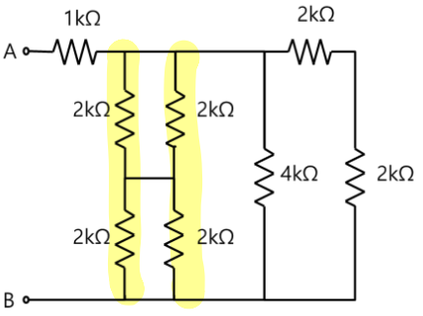
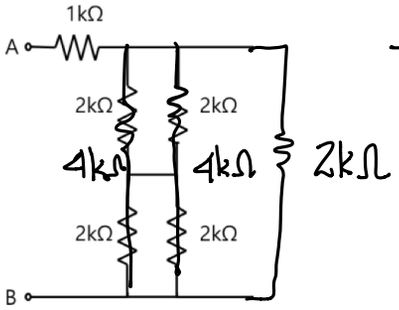
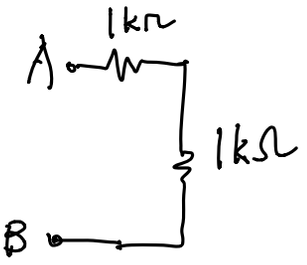
1. Find the resistance between terminals A-B in the following circuit.



$$\frac{1}{R_p} = \frac{1}{4} + \frac{1}{4} = \frac{1}{2}$$

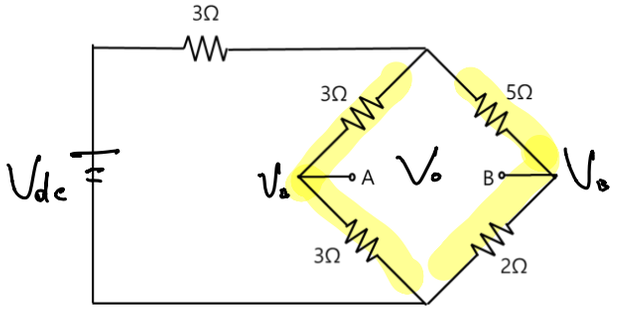


$$\frac{1}{R_t} = \frac{1}{2} + \frac{1}{4} + \frac{1}{4} = 1$$



∴ 2kΩ

2. Find the resistance between terminals A-B in the following circuit.



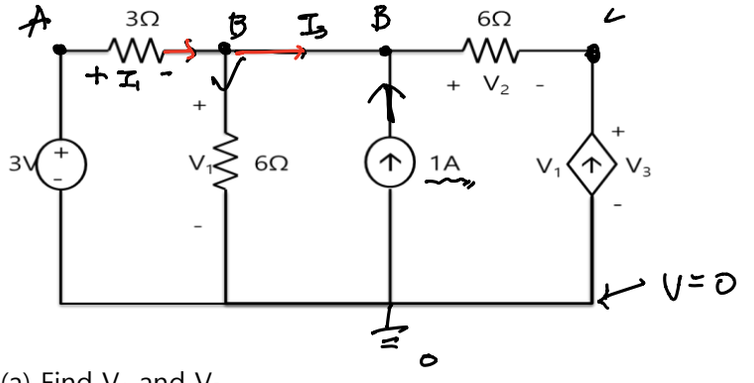
$\frac{1}{6} + \frac{1}{7} = \frac{13}{42}$

$V_{dc} \times \frac{\frac{42}{13}}{\frac{42}{13}+3} = V_{dc} \cdot \frac{\frac{42}{13}}{\frac{81}{13}} = V_{dc} \frac{42}{81} = V_{dc} \cdot \frac{14}{27} = V$

$V_o = V_A - V_B = \frac{3}{6}V - \frac{2}{7}V = \frac{9}{42}V = \frac{3}{14}V$

$\frac{3}{14} \times V_{dc} \times \frac{14}{27} = \frac{1}{9} V_{dc}$

3. Consider the following circuit.



(a) Find V_1 and V_2.

$I = \frac{V}{R}$

$V_A = 3V$

V_B

$\frac{V_1 - 3}{3} + \frac{V_1}{6} - 1 + \frac{V_2}{6} = 0$

$= 6V_1 + V_2 = 0$

$-V_2$

$\frac{V_c - V_b}{6}$

$\frac{-V_2}{6} - V_1 = 0$

$V_2 + 6V_1 = 0$

$V_1 = -4V, \quad V_2 = 24V$

(b) Find V_3 and the power absorbed or supplied by the dependent current source. (If P<0, the power is supplied. If P>0, the power is absorbed)

$V_1 - V_3 = V_2$

$-4V - 24V = V_3$

$-28V = V_3$

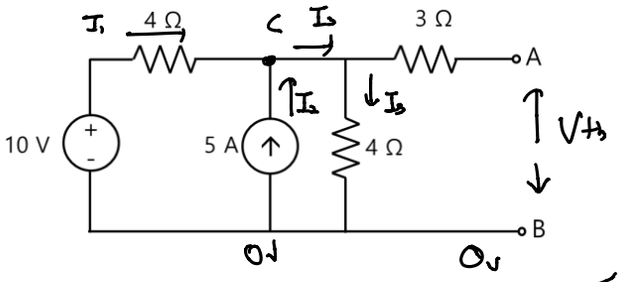
$P = VI = (-28)(V_1)$

$= 120 > 0$

Powers absorbed.

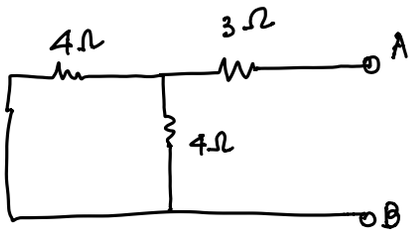
open 이기 때문에 $V_B = 0$

4. (a) Find Thevenin equivalent circuit between terminals A-B of the following circuit.

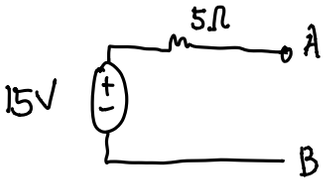


$V_C = V_A = V_{th} = 15\,V$

$R_{TH} = 5\Omega$



$\left(\frac{1}{4}+\frac{1}{4}\right)^{-1} + 3\Omega = 5\Omega$



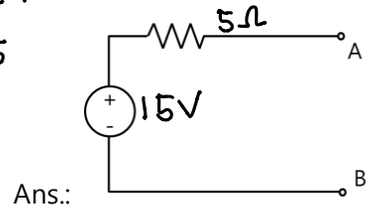
$I_1 + I_2 - I_3 = 0$

$I = \frac{V}{R}$

$\frac{10 - V_c}{4} + 5 - \frac{V_c - 0}{4} = 0$

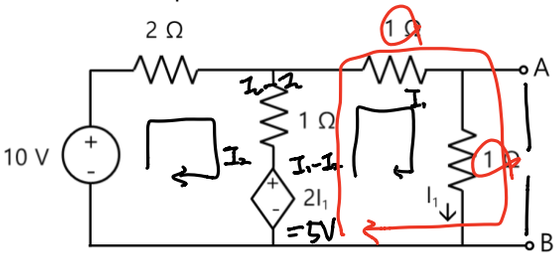
$10 - V_c + 20 - V_c = 0$

$V_c = 15$



Ans.:

(a) Find Norton equivalent circuit between terminals A-B of the following circuit.



$I_{s.c}$

① $-10 + 2I_2 + I_2 - I_1 + 2I_1 = 0$

$I_1 + 3I_2 = 10$

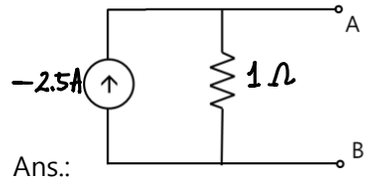
$I_1 = I_2 = 2.5$

② $I_1 - I_2 + I_1 + I_1 - 2I_1 = 0$

$I_1 - I_2 = 6$

$I_{sc} = -2.5$

$5V + 2I_{sc} = 0$



Ans.: