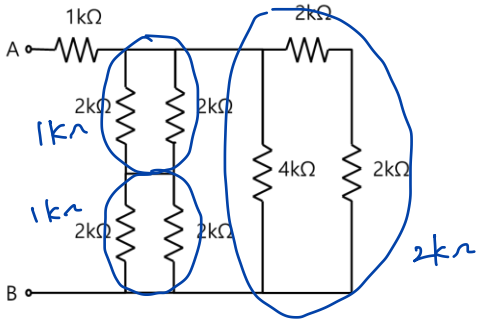
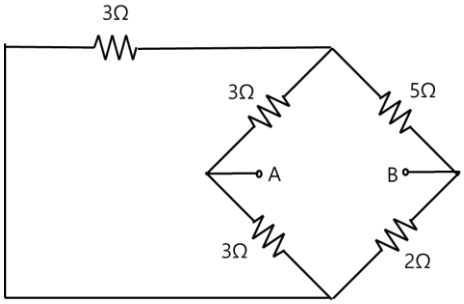
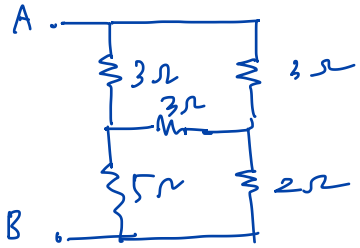
1. Find the resistance between terminals A-B in the following circuit.



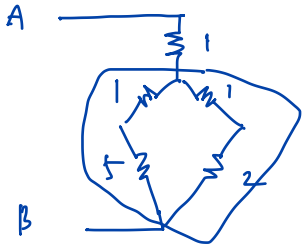
$\therefore R_{AB} = 2k\Omega$

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





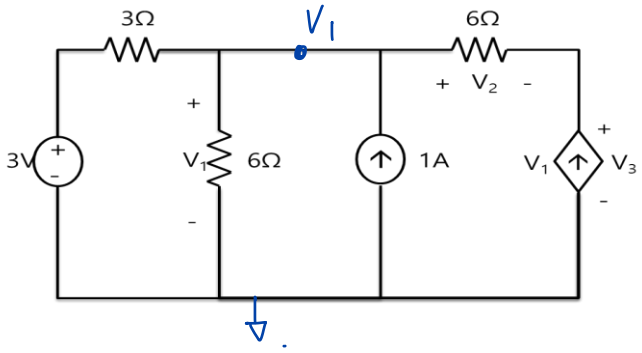
$$\frac{3 \cdot 3}{3+3+3} = 1$$



$$\frac{1}{R_p} = \frac{1}{6} + \frac{1}{3} = \frac{1+2}{6}$$

$$\therefore \quad R_{AB} = 3\Omega$$

3. Consider the following circuit.



(a) Find V_1 and V_2.

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

$$2V_1 - 6 + V_1 - 6 - 6V_1 = 0$$

$$-3V_1 = 12 \qquad \therefore V_1 = -4V.$$

$$V_2 = -V_1 \cdot 6 = 24V.$$

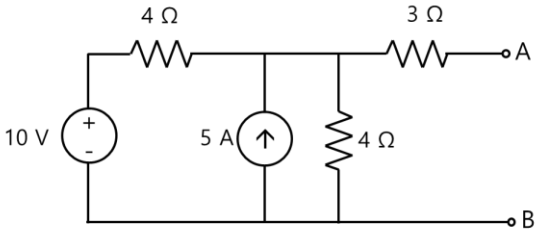
(b) Find V_3 and the power absorbed or supplied by the dependent current source. (If P<0, the power is supplied. If P>0, the power is absorbed)

$$V_1 = V_2 + V_3$$

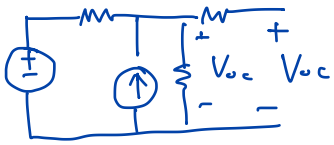
$$-4 = 24 + V_3 \qquad \therefore V_3 = -28V.$$

$$P_{\diamond} = -V_1 \cdot V_3 = -(-4)\cdot(-28) = -112W. \text{ (supplyed)}$$

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



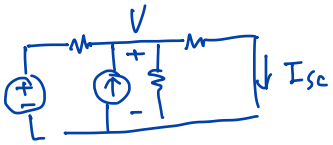
① For V_{oc}



$$\frac{V_{oc}-10}{4} - 5 + \frac{V_{oc}}{4} = 0.$$

$$2V_{oc} - 10 = 20. \quad \therefore V_{oc} = 15V.$$

② For I_{sc}



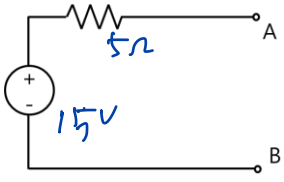
$$\frac{V-10}{4} - 5 + \frac{V}{4} + \frac{V}{3} = 0.$$

$$3V - 30 - 60 + 3V + 4V = 0 \quad V = 9V$$

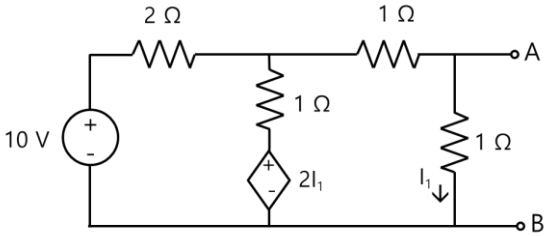
$$\therefore I_{sc} = 3\ A.$$

$$\therefore R_{TH} = \frac{15}{3} = 5\ \Omega$$

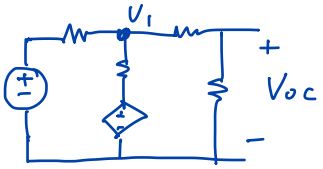
Ans.:



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



① For V_{oc}

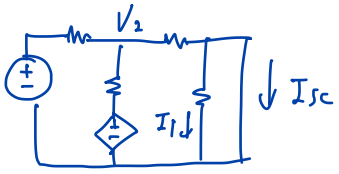


$$\frac{V_1-10}{2} - \frac{V_1-(2I_1)}{1} + \frac{V_1}{2} = 0.$$

(V_1 : "V_1")

$$I_1 = \frac{V_1}{2}. \qquad V_1 = 5V. \qquad V_{oc} = \frac{5}{2}V.$$

② For I_{sc}



$$\frac{V_2-10}{2} + \frac{V_2}{1} + \frac{V_2}{1} = 0.$$

$$V_2 - 10 + 4V_2 = 0. \quad \therefore V_2 = 2V.$$

$$I_{sc} = 2A.$$

$$R_{Th} = 5/2 \,/\!/\, 2 = 1/4$$

Ans.: