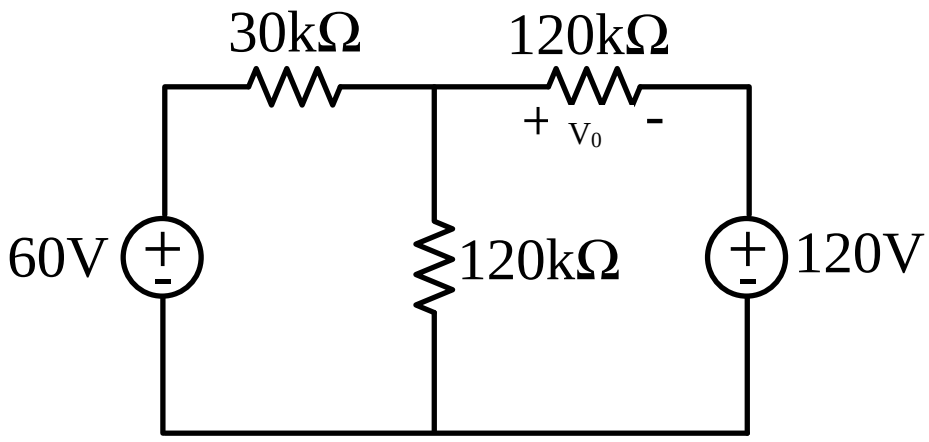
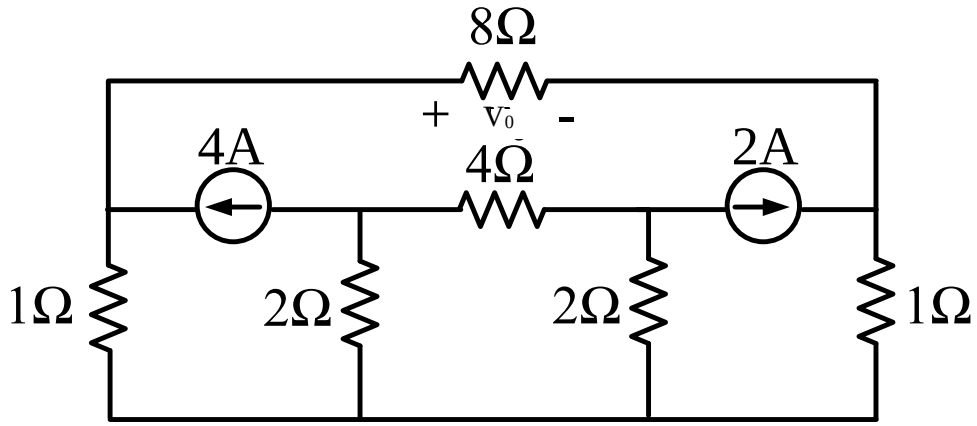
# Tutorial-1

**Q1** Obtain $V_0$ in the circuit using nodal voltage and loop current methods.

[ Ans $V_0$=-60V)

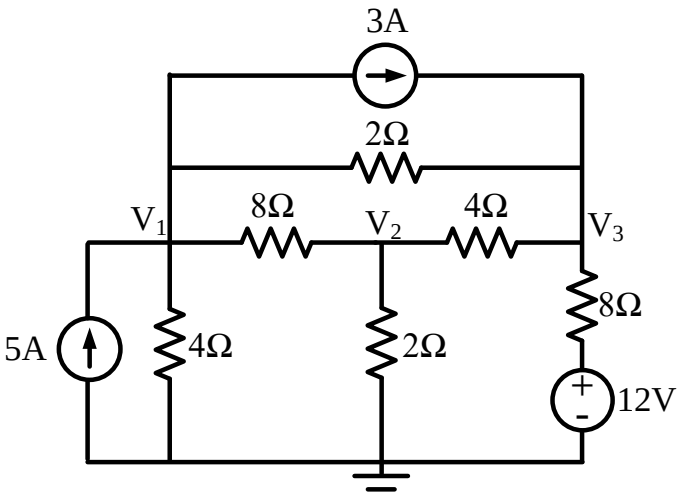



**Q2** Find Vo in the circuit across the 8 Ω resistor.

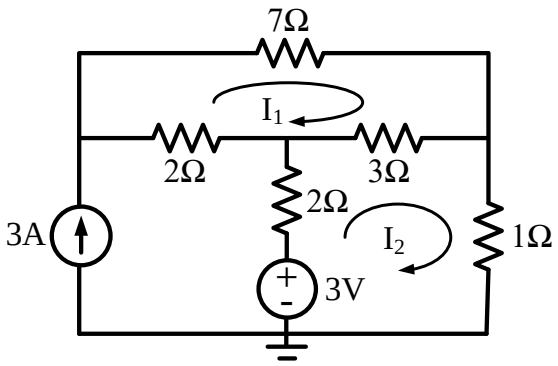



[Ans $V_0$=1.6 V]

Q 3: Find $V_1$, $V_2$, and $V_3$ in the circuit. [ Ans $V_1$ = 10 V, $V_2$ = 4.933 V, and $V_3$ = 12.267 V]

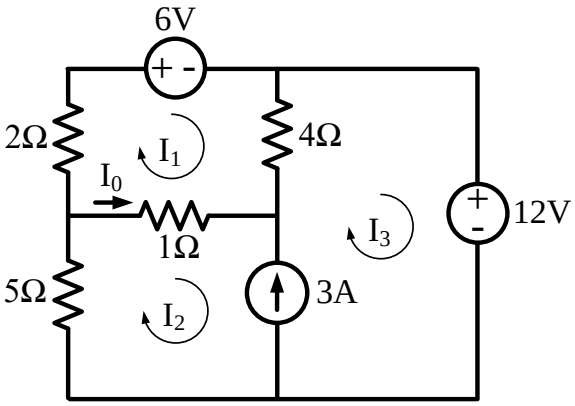


**Q4** Find the loop currents $I_1$ and $I_2$ in the circuit using mesh current method.



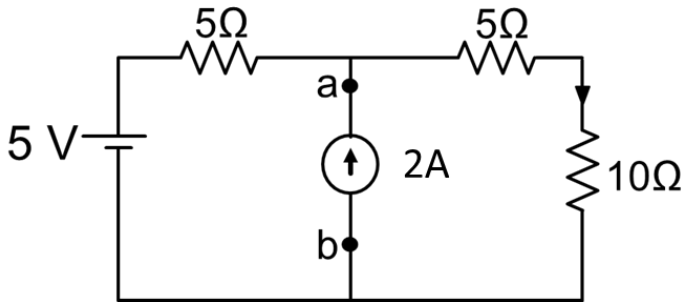

[Ans $I_1$ = 1 A and $I_2$ = 2 A]

**Q5:** Find $I_0$ in the circuit using mesh current method.



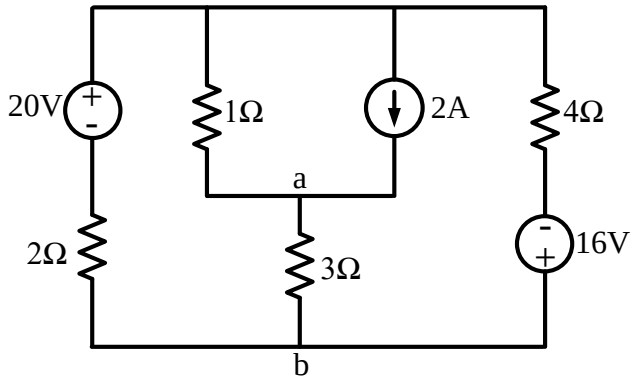

[Ans $I_0$ = -1.733A]

**Q6.** Find the voltage ($V_{ab}$) across 2 A source using Thevenin's theorem.



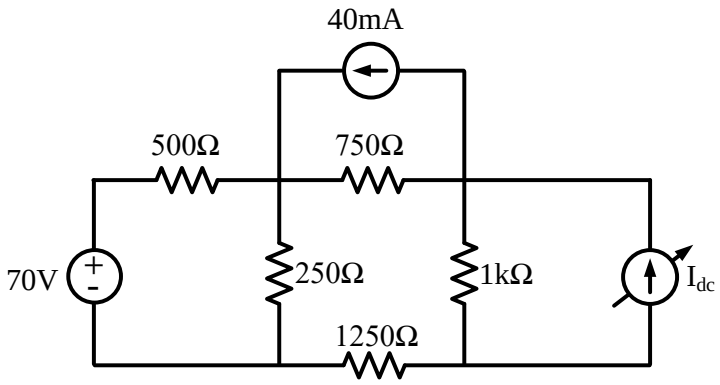

[ Ans $V_{ab}$ = 11.25 V]

**Q7** Find the Norton equivalent across terminals ab and then find the voltage across 3Ω resistor in the circuit.



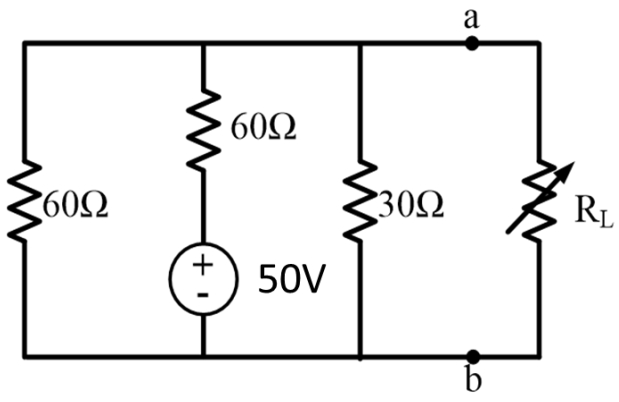

[ Ans $R_N = (7/3)\ \Omega$, $I_N = (30/7)$ A, $V_{3\Omega} = (45/8)$ V]

**Q8:** Obtain the required value of the variable current source $I_{dc}$ shown in the figure for which the power delivered by the 40mA current source will be zero.



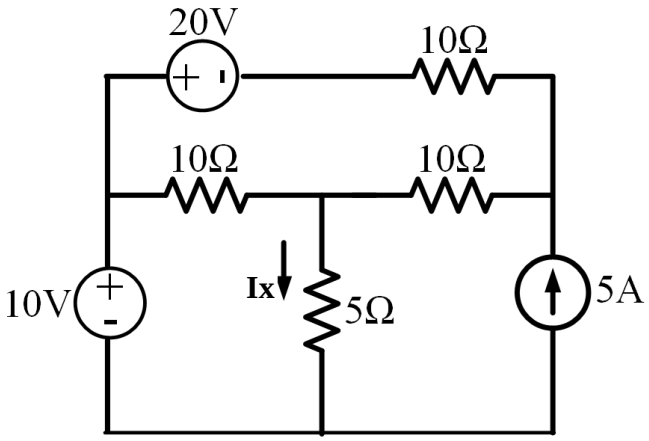

[ Ans $I_{dc} = 120$mA]

**Q9** Find the maximum power that the active network to the left of terminals *ab* can deliver to the adjustable load resistor $R_L$.

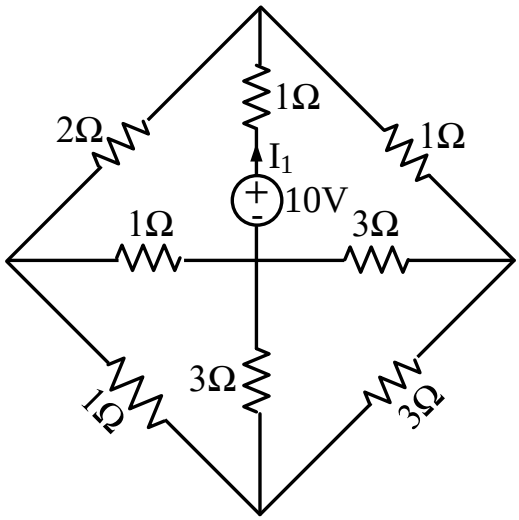



[Ans 2.60 W]

**Q10:** While solving the circuit using superposition theorem, find the current ($I_x$) through 5Ω resistor contributed by 10V, 20V, and 5A sources individually. Ans [$\frac{1000}{1167}A$, $-\frac{4}{7}A$, $\frac{10}{7}A$]

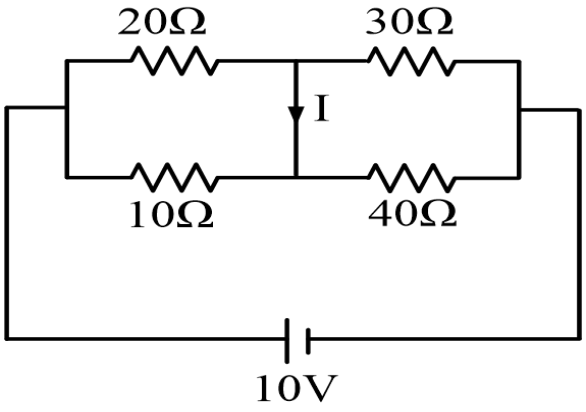



**Q11** Find current $I_1$ in the 1 ohm resistance as shown using Thevenin's theorem.




[ Ans $V_{Th}$ = -10 V, $R_{Th}$ = 1.5 Ω, and $I_1$ = 4.0 A ]

**Q12** Find current I in the circuit.




[ Ans I = -0.1A]