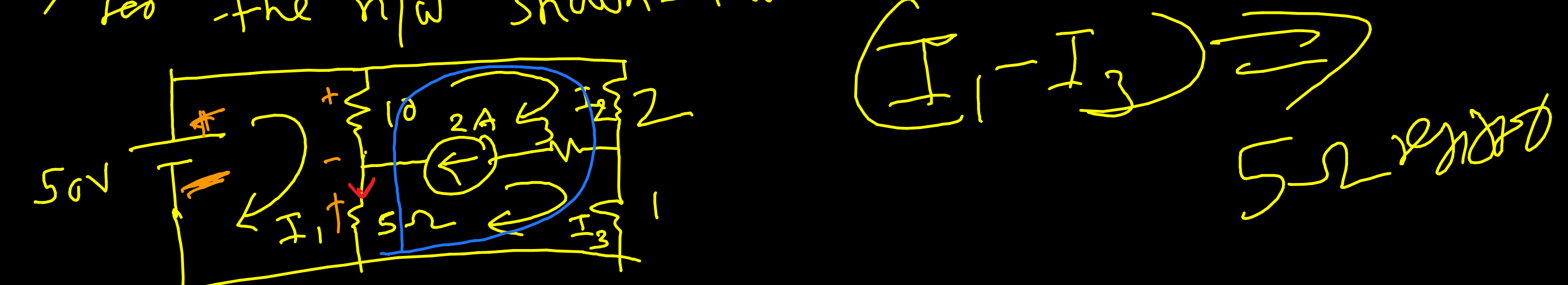


Super Mesh Analysis :

Meshes that share a current source with other meshes, none of which contain the current source in outloop, form a supermesh.

Q1) Find the current in 5Ω resistor for the n/w shown below



Solⁿ Writing current eqn for Supermesh

$$I_2 - I_3 = 2 \quad \text{--- (1)}$$

Applying KVL in loop (1)

$$50 - 10(I_1 - I_2) - 5(I_1 - I_3) = 0$$

$$15I_1 - 10I_2 - 5I_3 = 0 \quad \text{--- (2)}$$

Applying KVL to outloop of supermesh

$$-10(I_2 - I_1) - 2I_2 - 1I_3 - 5(I_3 - I_1) = 0$$

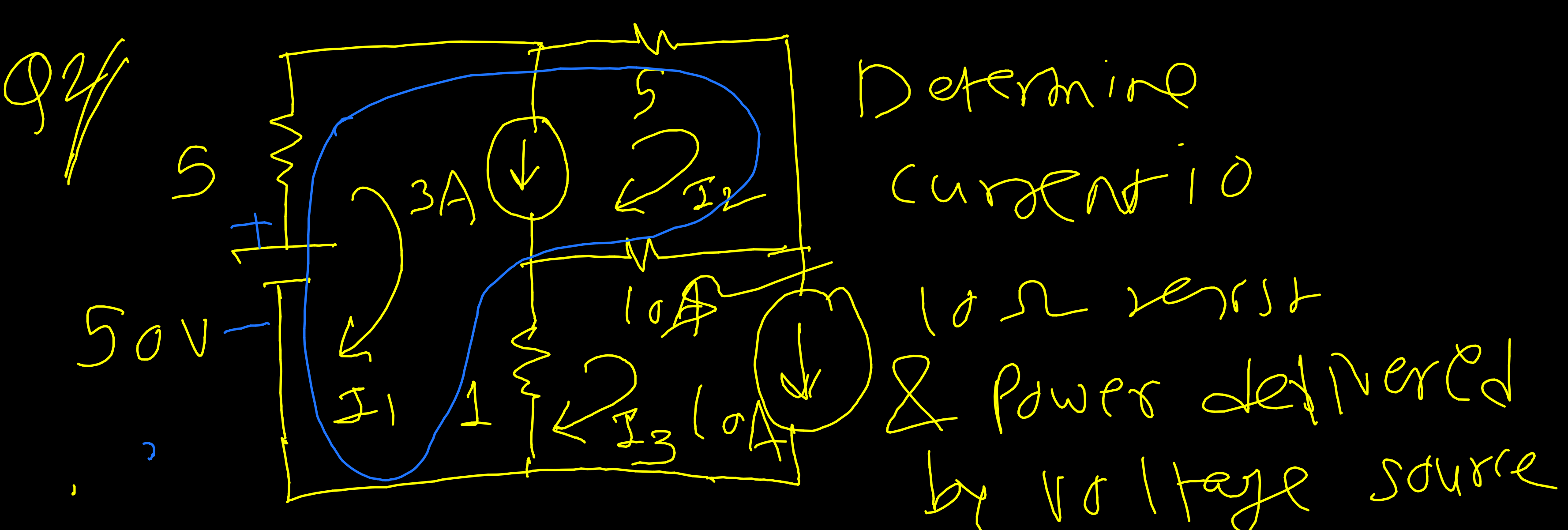
$$-15I_1 + 12I_2 + 6I_3 = 0 \quad \text{--- (3)}$$

$$I_1 = 20A, I_2 = 17.33A$$

$$I_3 = 15.33A$$

Current through 5Ω resistor

$$= I_1 - I_3 = 20 - 15.33 = 4.67A$$



Determine current in

10Ω resist & power delivered by voltage source

Solⁿ Meshes 1 & 2 will form a Supermesh

Writing current eqn for supermesh

$$I_1 - I_2 = 3 \quad \text{--- (1)}$$

Applying KVL to outloop of supermesh.

$$50 - 5I_1 - 5I_2 - 10(I_2 - I_3) - 1(I_1 - I_3) = 0$$

$$-6I_1 - 15I_2 + 11I_3 = -50$$

For mesh 3,

$$I_3 = 10 \quad \text{--- (2)}$$

Power delivered by voltage source

$$Source = 50I_1 = 50 \times 9.76 = 488W$$

$$I_{10\Omega} = I_3 - I_2 = 10 - 6.76$$

$$= 3.24A$$

$$I_1 = 9.76A$$

$$I_2 = 6.76A$$

$$I_3 = 10A$$