CASE 1 When a current source exists only in one mesh: Consider the circuit in Fig 3.22, for example. We set i2 = -5 A and write mesh equation for the other mesh in the usual way; that is,

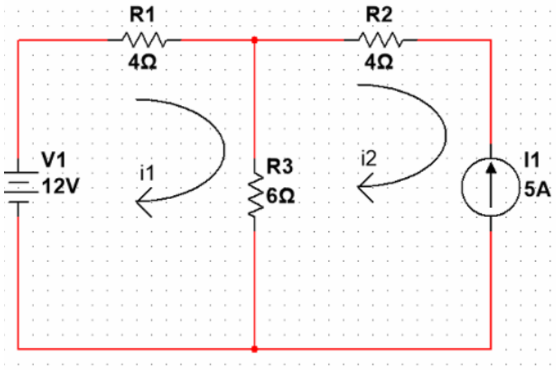

Figure 3.22

$$-10 + 4i_1 + 6(i_1 - i_2) = 0- > i_1 = -2A$$

CASE 2 When a current source exists between two meshes: Consider the circuit in Fig. 3.23(a), for example.

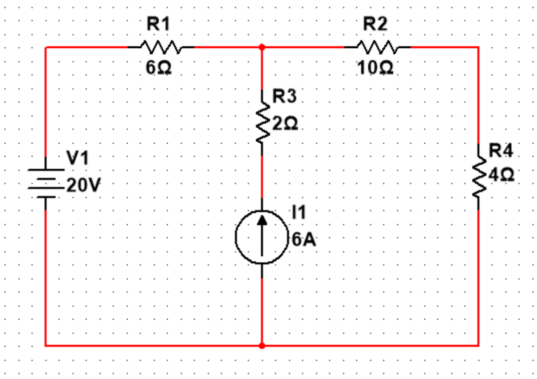

Figure 3.23(a)

We create a super mesh by excluding the current source and any elements connected in series with it, as shown in Fig.3.23(b).

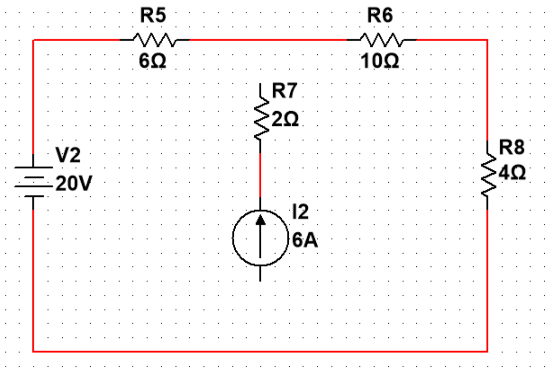

Figure 3.23(b)

Apply KCL to the super mesh in Fig.3.23(b) gives

$$-20 + 6i_1 + 10i_2 + 4i_2 = 0$$

or

$$6i_1 + 14i_2 = 20 - - - - - equation1$$

Apply KCL to the bottom node 0 in Fig.3.23(a) gives

$$i_2 = i_1 + 6 - - - - - equation2$$

Solve Eqs 1 and 2, we get

$$i_1 = -3.2A$$
$$i_2 = 2.8A$$

Properties of a super mesh

1. The current source in the super mesh provides the constraint equation necessary to solve for the mesh currents.
2. A super mesh has no current of its own.
3. A super mesh requires the application of both KVL an KCL\

Ex2.3 Apply mesh analysis to find i in Fig 2.3.

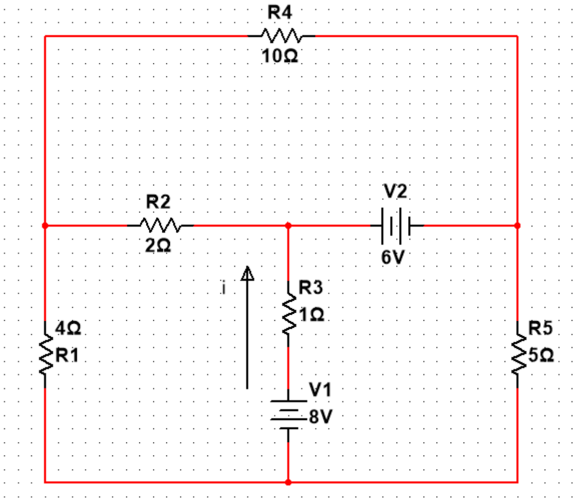

Figure 2.3