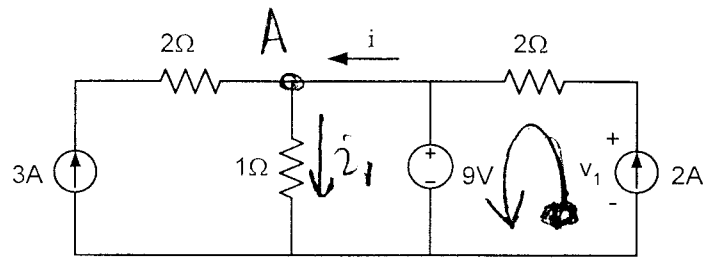
Q#1 For the following single node circuit find,

(a) current **i**

(b) voltage $\mathbf{v_1}$



(a) Since voltage across 1Ω and 9V source is same (parallel connection).

$$i_1 = \frac{9}{1} = 9A$$

Apply KCL at A

$$i_1 = i + 3 \Rightarrow \boxed{i = 6A}$$

(b) Applying KVL in last loop

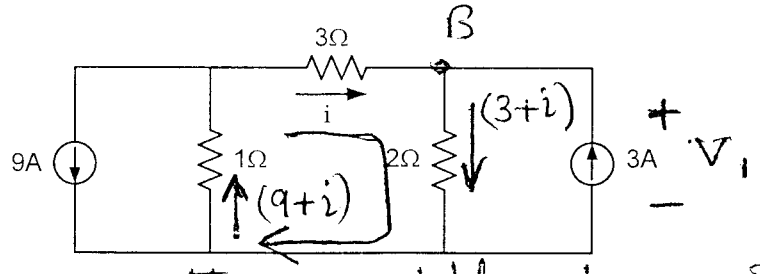
$$-V_1 + (2)(2) + 9 = 0 \Rightarrow \boxed{V_1 = 13V}$$

Q#2 For the following circuit, find

(a) current **i**

(b) power of 3A current source, indicate if it is absorbed or delivered

NOTE: DO NOT USE SOURCE TRANSFORMATION



(a) Applying KVL in the middle loop after applying KCL and KVL at A & B.

$$(3i) + 2(3+i) + 1(9+i) = 0$$

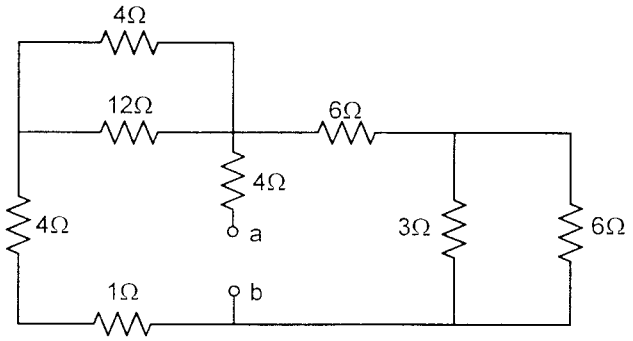
$$\Rightarrow \boxed{i = -\frac{5}{2}\ A}$$

(b) $V_1 = (3+i)2 = 1$ volt.

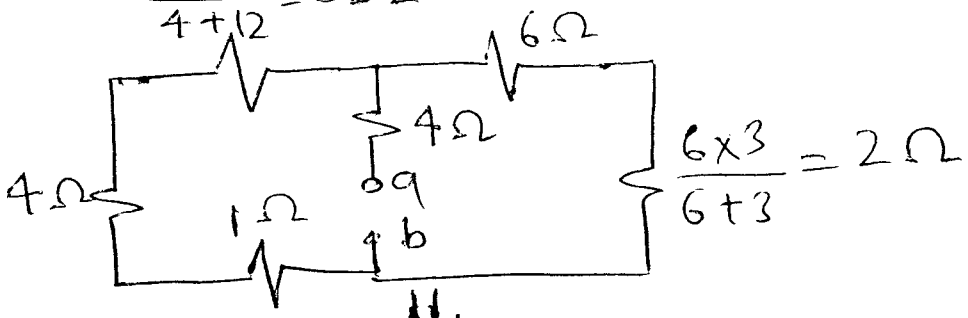
$$P_{3A} = -(3)(V_1)$$

$$\boxed{P_{3A} = -3W \text{ delivered}}$$

Q#3 Find R_{ab} (the resistance seen at terminals 'a' and 'b')



$\frac{4\times12}{4+12} = 3\Omega$



$\frac{6\times3}{6+3} = 2\Omega$