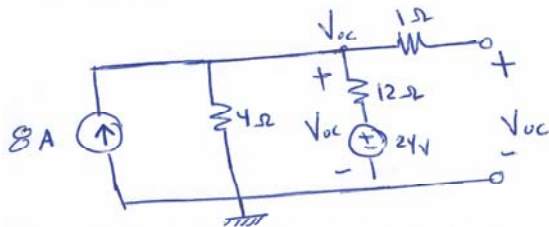| Sec	Ser	ID	Name

For the circuit shown, the load resistant is **R$_L$**.

Find the **maximum power** absorb by load resistant is **R$_L$**?
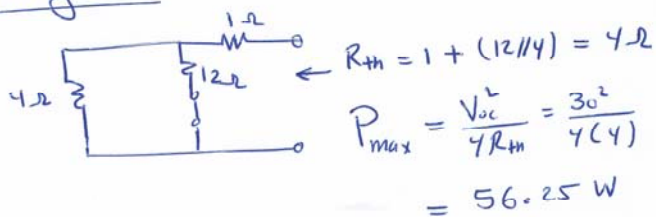
method①
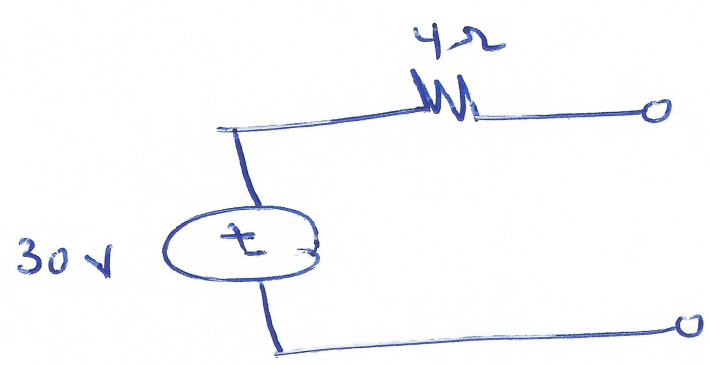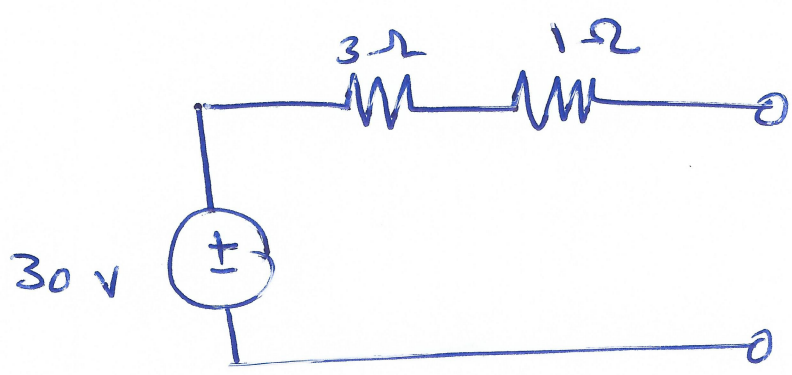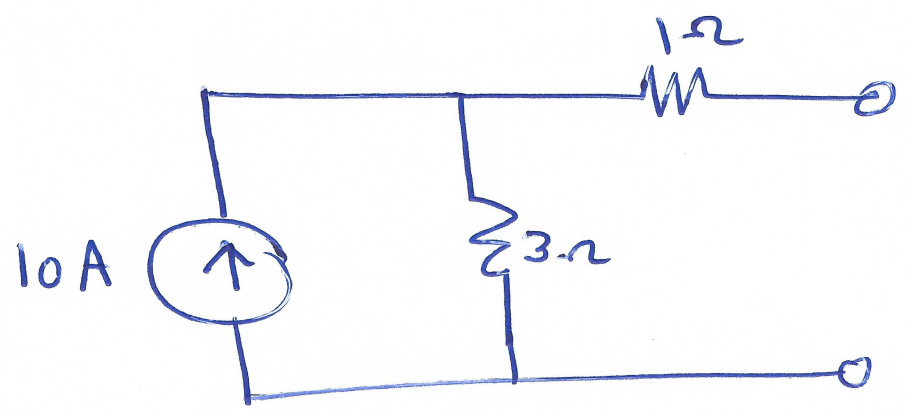
Finding V_{oc}

Kcl at node V_{oc}
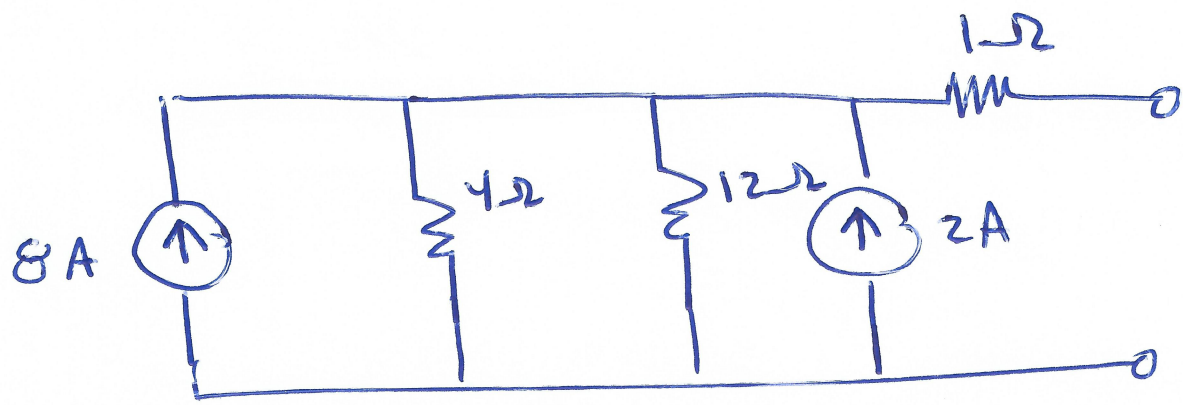
$$-8 + \frac{V_{oc}}{4} + \frac{V_{oc} - 24}{12} = 0$$

$$V_{oc} = 30 \text{ V}$$

Finding R_{th}

$$R_{th} = 1 + (12//4) = 4\Omega$$

$$P_{max} = \frac{V_{oc}^2}{4 R_{th}} = \frac{30^2}{4(4)}$$

$$= 56.25 \text{ W}$$

method ②

$R_L = R_{th} = 4\,\Omega$

$$P_{max} = \frac{V_{oc}^2}{4R_{th}}$$
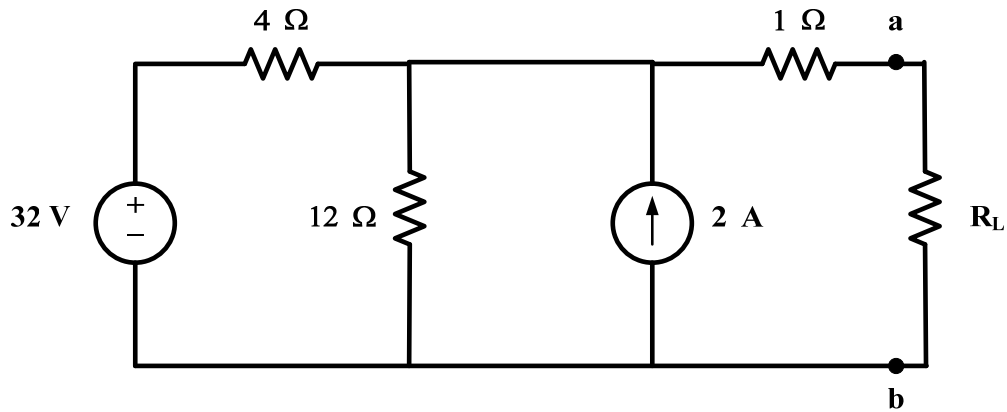
$$= \frac{30^2}{4(4)} = 56.25\,W$$
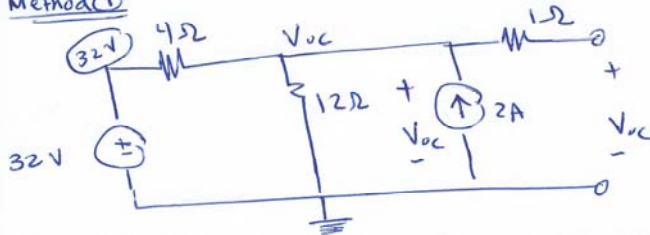
Sec	Ser	ID	Name

For the circuit shown, the load resistant is **R_L**.

Find the **maximum power** absorb by load resistant is **R_L**?
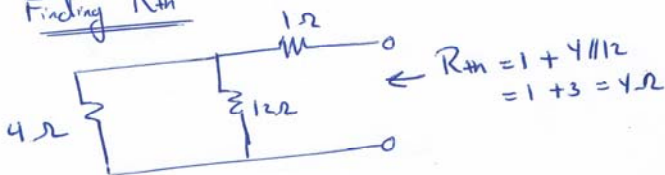
Method(1)

$$\frac{V_{oc} - 32}{4} + \frac{V_{oc}}{12} - 2 = 0$$

Finding V_{oc}

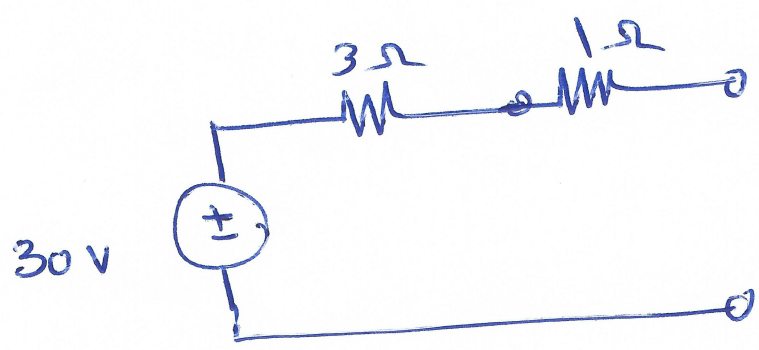kcl at node V_{oc}
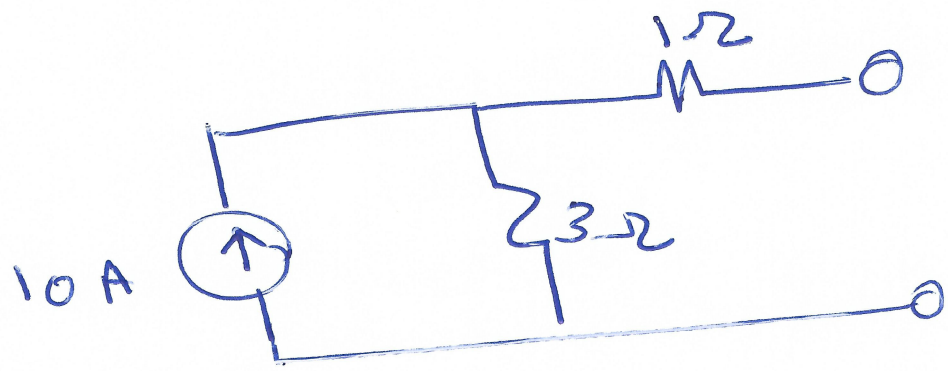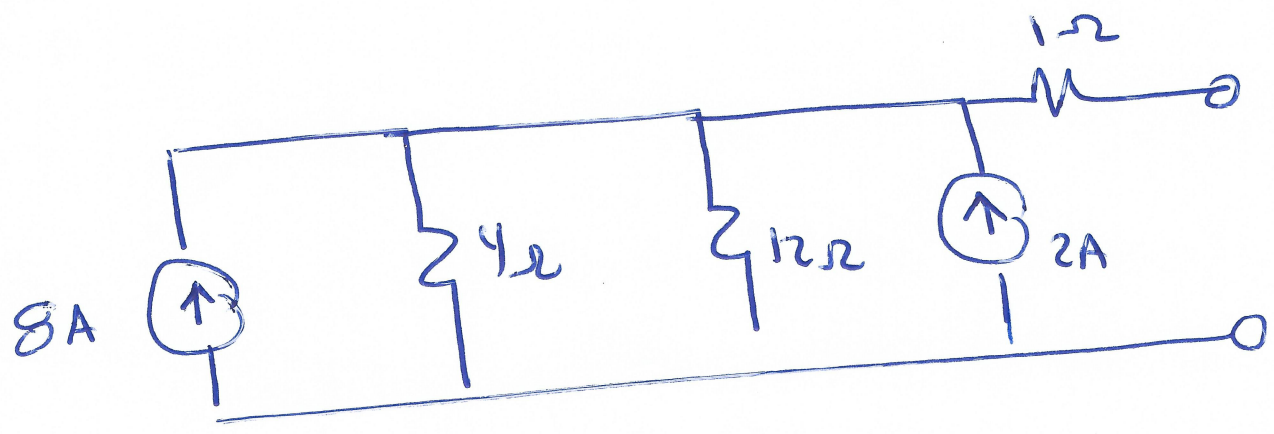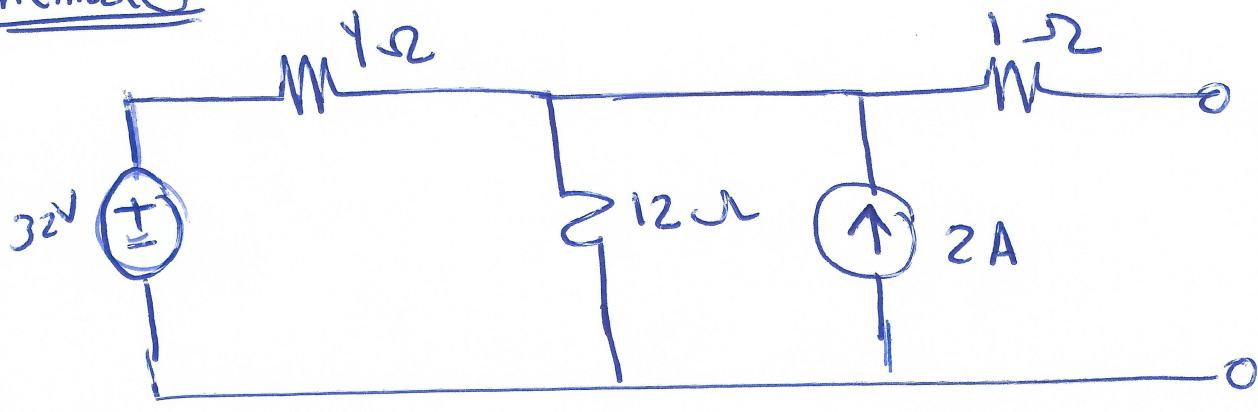
$$\Rightarrow V_{oc} = 30$$

Finding R_{th}

$$R_{th} = 1 + 4 \| 12$$
$$= 1 + 3 = 4\Omega$$

$$\Rightarrow R_L = R_{th} = 4\Omega$$

$$P_{max} = \frac{V_{oc}^2}{4R_{th}} = \frac{30^2}{4(4)} = 56.25W$$

method ②

Circuit 1: 32 V source (+/−) in series with 4 Ω resistor, 12 Ω in parallel, 2 A current source, 1 Ω resistor to output terminals.

Circuit 2: 8 A current source, 4 Ω in parallel, 12 Ω in parallel, 2 A current source, 1 Ω resistor to output terminals.

Circuit 3: 10 A current source, 3 Ω in parallel, 1 Ω resistor to output terminals.

Circuit 4: 30 V source in series with 3 Ω and 1 Ω resistors to output terminals.

Circuit 5: 30 V source in series with 4 Ω resistor to output terminals.

$$R_L = R_{th} = 4\,\Omega$$

$$P_{max} = \frac{V_{oc}^2}{4R_{th}}$$

$$= \frac{30^2}{4(4)} = 56.25\,w$$